



**REPORT**  
**OF THE**  
**REVIEW COMMITTEE ON ELECTRONICS.**

**SEPTEMBER, 1979**



सत्यमेव जयते



Do No. 865/S/SSMC/29

भारत सरकार  
सचिव

GOVERNMENT OF INDIA  
SECRETARY  
MINISTRY OF STEEL, MINES & COAL  
NEW DELHI

Mantosh Sondhi

30 September '79

My dear Nirmal,

I have great pleasure in enclosing herewith three copies of the Report of the Review Committee on Electronics set up in December last year, under my Chairmanship with Prof. B. Nag, Secretary, Department of Electronics, Shri J.A. Dave, Secretary, Ministry of Communication (now Defence Secretary), Shri M. Menezes, Secretary, Department of Defence Production (now Chairman, Railway Board), as Members.

2. In giving you a brief resume of what the conclusions of the Committee are I can do no better than to reproduce a few paragraphs from Chapter 15 of the Report on 'Conclusions and Summary of Recommendations.'

3. These paragraphs run as under:

"The Committee has completed, in accordance with its terms of reference, a review of the policies, procedures and institutional framework in the Department of Electronics (including the Electronics Commission). In undertaking this review, consultations in depth were held with the electronics industry in all its segments both in the private and the public sectors, Government agencies concerned with electronics directly or indirectly, R & D institutions and professional experts. As a result, the Committee has come to the conclusion that it is possible to achieve much higher and faster rate of growth in the production and use of electronics in the country than has been the case hitherto. This objective can be realised if the existing restrictive climate is replaced by one of positive promotion, consistent with the national socio-economic priorities.

2. Towards this direction, the Committee has recommended a package of measures in the area of industrial approvals, import and tariff policies, fiscal and financial arrangements and exports. The essence of this package is the dismantling of unnecessary controls, restrictions and regulations but with an overall coordinated and integrated approach on growth, with due regard to specific strategies of development. Multi-channel and multi-agency approvals seem to have retarded growth in the past. Streamlined procedures have, therefore, been suggested as well as approvals by a single-point nodal agency, moved by group dynamics so that the Department of Electronics can be held fully accountable for the development of the electronics industry in the country. In respect of the Free Trade Zone, it has been clearly brought out that unless we offer similar facilities, as some of our neighbouring countries do, it will continue to languish. Measures for strengthening the role of the small sector especially in the production of certain types of consumer electronics and in employment intensive assembly operations, have been clearly brought out. Its complementarity to the organised sector has also been stressed.

3. Substantial but selective investments in production-oriented research and development programmes have been highlighted; so also the need for the development of suitable manpower. Specific measures for standardisation and quality assurance have been suggested.

4. To obviate stagnation in the area of computers, specific steps have been proposed for stimulating production and use of computers with due regard to the accelerated development of key sectors of the economy but fully consistent with our socio-economic requirements including the sensitive issue of employment potential. Streamlining of procedures for import of such computers which do not lend themselves to economical production in the short term, has been suggested. An organisational restructuring of the facilities in the public sector for the manufacture and maintenance of computers has also been proposed. The need for greater coordination at the national level for more effective utilisation of costly and powerful computer systems set up in the country has been emphasised.

5. A series of measures for the restructuring of the present Department of Electronics, the Electronics Commission and the organisations functioning under them have been suggested with a view to ensuring clearly demarcated functional and organisational responsibilities. With the implementation of these measures, Department of Electronics assisted by the high-powered inter-ministerial Boards which have been recommended, would have the primacy of policy direction and implementation. The Electronics Development Commission replacing the present Electronics Commission, would essentially be a high level advisory body, free from executive responsibilities, with an enlarged membership concerning itself with studies of and advice on perspective planning for self-reliance, integrated development of the electronics industry, the inter-sectoral applications of electronics and R & D efforts. Its new role would be that of a 'think tank'. Consequently, the existing organisations supporting its activities will be merged in the Department of Electronics."

4. I am sorry that the Committee could not complete its work earlier. It was virtually impossible to do so considering the pre-occupation of the Committee Members with their normal work and the very wide terms of reference given to the Committee.

With kind regards

Yours sincerely,

*Mantosh Samal*

Shri N.K. Mukarji  
Cabinet Secretary  
New Delhi



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## CHAPTER 1

### ELECTRONICS : THE PACE SETTER

In today's world, electronics has permeated all economic activity and walks of life; there is practically no field of human effort which does not derive its strength and sustenance from this vital branch of science and technology. In the last two decades, the advances in electronic technology have led to an explosion of new products and processes, leading to the replacement, by and large, of existing electro-mechanical products and processes offered by the older industries. A M.I.T. study sums up this technological revolution in electronics thus: if the technological progress in the automobile industry had been as rapid as that in the electronics industry, the cost of producing a Rolls Royce would be the equivalent of Rs 20 and this car would run on a litre of petrol for 5 lakh kilometers. The London Economist, 1978, says that electronic technology has already seen the introduction of chips which can now 'talk' back to a consumer and have a vocabulary varying from 50 to 1500 words. The impact that this technology is going to make on our future lives therefore deserves far more attention than it has received till now.

1.2 World production of electronics in 1976 exceeded US Dollars 125 billion (Rs 100,000 crores); it is expected to reach US Dollars 169 billion (Rs 135,000 crores) in 1980. With an average capital output ratio of 1:8 in several segments of this industry, with a low gestation period and high employment to capital ratio and therefore a high potential for employment generation, it is little wonder that this industry is becoming a pace-setter in many developed as well as developing economies.

1.3 Assembly units in the electronics industry are highly labour intensive, which makes such operations ideally suitable for developing countries like India. With a large reservoir of skilled manpower supported by a high degree of technical, technological and managerial competence, there is great potential for the development of electronic industries in India. Moreover, assembly operations in this industry are ideally suited for production by small enterprises. Even in the case of sophisticated components manufacturing units in the electronics industry which are naturally more capital intensive, the potential for indirect employment generation is much higher as would be clear from the following table :—

Industry group	Fixed assets requirements for creating an extra job	Number of jobs created with Rs 1 crore of investment
Chemicals & Petrochemicals	Rs 3,04,400	33
Power Generation and Distribution	2,66,467	35
Non-ferrous Metal products	2,00,837	49
Ferrous products	1,50,331	66
Sugar	1,42,827	70
Rubber products	1,31,022	76
Automobiles & Bicycles	1,09,443	91
Pulp, paper and paper products	96,865	103
Machinery manufacturing	79,615	126
Textiles	74,940	133
Electrical equipment	40,542	246
Electronics	32,129	312

(Source : Engineering World, August, 1978)

1.4 The ever expanding vistas of technology in electronics are attracting the most creative and intelligent of human beings, cutting across divisions like nations, races and economic communities. Indian electronics engineers have established a reputation for themselves not only at home but in the developed world abroad, manning key positions in giant organisations.

1.5 Developing economies like those of South Korea and Taiwan have boomed because of the hospitable climate created for the rapid growth of the electronics industry. Unfortunately the Indian scene in electronics, even after two decades is marked by a slow rate of growth; production in 1978-79, covering all sectors of electronics, was of the order of Rs 620 crores—an insignificant share of the global production. This is unfortunate, as the most important of all resources in this field is possessed by this country, namely an abundance of skilled and employable manpower and a high degree of technological competence. It is a matter of real concern that we lose every year one of our most valuable assets, namely our electronics engineers in large numbers to other countries.

1.6 Our Draft Sixth Five Year Plan envisages an annual production level of Rs 1,200 crores in 1982-83; however, industry circles and experts consider an annual target of Rs 3,200 crores with an export component of Rs 500 crores within the next five years as feasible, if a proper climate for the development and growth of the electronics industry is created. The potential for development doubtless exists; but actual progress is disappointing.

1.7 The concept of rapid development of the electronics industry which is a forceful catalyst for the growth of our national economy fits in ideally with our national priorities and resource endowments. This report seeks to highlight the directions in which steps should be taken to ensure the rapid growth of the industry to new attainable heights and also spells out the measures needed to achieve this within the broad framework of the existing national policy guidelines.

## CHAPTER 2

### THE REVIEW COMMITTEE

A Committee of Secretaries was appointed in December 1978 and entrusted with the task of undertaking a quick review of the policies, procedures and institutional framework in the Department of Electronics (including the Electronics Commission) and of recommending the new directions in these areas with a view to providing a fillip to the growth of this industry. The composition of the Committee was:

1. Shri Mantosh Sondhi (Chairman)  
Secretary  
Ministry of Steel & Mines
2. Dr B. Nag  
Secretary  
Department of Electronics
3. Shri J.A. Dave  
Secretary  
Ministry of Communications
4. Shri M. Menezes  
Secretary  
Department of Defence Production

2.2 Shri N. Sivasubramanian, Joint Secretary, Department of Electronics functioned as the Secretary of the Committee. The Committee was directed to complete the review and submit a report preferably within three months. A copy of the order setting up the Committee is at Appendix 2.1. The Committee had its first meeting on 21st December, 1978.

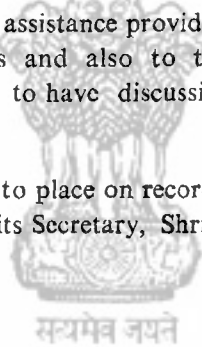
2.3 To start with, the Committee invited the views of the Ministries and Departments of the Central Government and the State Governments, as also those of the Public Sector Undertakings and Associations of Industries in the field of electronics. Some of the leading Research & Development Institutions, in both the public and private sectors, were also requested to give their views on all matters relevant to the terms of reference of the Committee. Some professional societies and individuals also made their views available to the Committee. At the request of the Associations of Industry, the Committee also met the representatives of the industry from the public and private sectors, including representatives of small scale sector, in Bangalore (77), Bombay (32), Delhi (31), Chandigarh (19), Calcutta (52), Hyderabad (26), and Lucknow (25). (The figures in brackets indicate the number of representatives who met the Committee). Representatives of industry from almost all the States were present at the various centres. The Members of the Committee had discussions collectively and individually with various organisations and individuals and received a large number of representations orally and in writing. The Committee had 18 sittings of its own in order to analyse and sift all the material furnished to it for an appreciation of the perspectives and problems. As the views asked for by the Committee took some time to come in, especially from the Associations of Industry and the Ministries and Departments of the Central

Government which had a contribution to make, the Committee felt that the responsibilities assigned to it by the Prime Minister could be discharged only after mature consideration of the complex issues involved, even if this meant some delay in the submission of the report. The Ministries, Departments, Organisations etc. which tendered data and views to the Committee, are listed in Appendix 2.2.

2.4 The succeeding chapters present the various problems the industry is facing and the unanimous views and recommendations of the Committee.

2.5 The Committee wishes to thank all the organisations and individuals who assisted it, in its deliberations, with their knowledge, experience and expertise and would like to record its appreciation of their contribution. The Committee has drawn freely upon many of the ideas and proposals put forward by them. The organisations and individuals who interacted with the Committee are listed in Appendix 2.3. The Committee would like to specially thank Prof M.G.K. Menon, Dr R. Ramanna, and Prof S. Sampath who gave the Committee the benefit of discussions with them. The Committee is very grateful to (late) Brig. B.J. Shahaney and (late) Shri K. Rajagopalan for the assistance and guidance which they gave to the Committee. The Committee is grateful to the State Governments of Karnataka, Maharashtra, Punjab, West Bengal, Andhra Pradesh and Uttar Pradesh and their Electronics and Industrial Development Corporations for the assistance provided by them in arranging meetings with industries in their respective regions and also to the Association of Indian Engineering Industries for inviting the Committee to have discussions with their members in a workshop organised in Delhi.

2.6 The Committee would like to place on record its deep appreciation of the excellent, dedicated and tireless work put in by its Secretary, Shri N. Sivasubramanian.



## CHAPTER 3

### CURRENT STATUS OF THE INDIAN ELECTRONICS INDUSTRY

The Bhabha Committee estimated that annual electronics output would reach a level of Rs 480 crores in a 10 year period. This estimate was at 1966 prices. The achievement by 1975 was around that figure, but at current prices, indicating a shortfall of about 50%. The value of the production in the electronics industry and the annual growth rates from 1961 are given in Appenedix 3.1. The limited progress was the result of the import substitution policy necessitated by the shortage of foreign exchange in the 1960's. However, the import control protection which the indigenous manufacturers enjoyed there by, acted in another direction as a disincentive to cost and quality consciousness. The indigenous industry made substantial progress in the production of TV sets and ancillaries, as the direct result of the Government's decision to set up a network of television broadcasting services in the country. The developments in the different sectors of the industry are given below:

#### 3.2 Telecommunications

The value of production of telecommunication equipment, over the years, is given in Appendices 3.2 and 3.3. The share of communication equipment in total production in 1977 was 25%, it dropped to 21% in 1978. This sector is largely independent of market forces, the major users being Government in the areas of Communication, Defence and Railways. The trend in this area is now in favour of electronic telecommunication systems as distinct from electromechanical systems. Large scale application of digital communication technology and use of integrated communication systems are contemporary developments; their absence and inadequate capacities on the ground explain the relatively small exports in this area. Telecommunication is highly technology intensive and production involves long gestation periods. It requires considerable investment in R&D which may take 5 to 7 years to fructify. The area is also characterised by high rates of technological obsolescence. A reason, according to industry circles, for low production in this area is the policy of restricting the production of many of the items to units in the public sector under the Industrial Policy Resolution, despite the recommendations of the Bhabha Committee to the contrary and their acceptance by the Government.

#### 3.3 Computers

The Bhabha Committee estimated that, in the 10 years period from 1966, the country would need to progress through the use of 16 large computers, 500 medium computers and 5000 small computers, at a cost of Rs 107 crores; the actual realisation was 99 indigenous computers and 350 imported computers including dedicated digital processors, at an estimated cost of about Rs 100 crores. Of the 120 large and medium computers imported after detailed scrutiny by the Department of Electronics in the last 7 years, 45 were imported by Government, 45 by Government financed public institutions and 30 by the private sector. This has led to over 60 different types of imported computer systems having to be used and maintained in India. The public sector undertaking, Electronics Corporation of India Ltd. (ECIL), has put forth only two small sized computers TDC-312 and TDC-316. The complete software packages for the latter type are yet to be fully developed. A micro-processor based system developed by ECIL is also yet to be adequately supported by software facilities and a



32 bit medium sized computer is still under development in ECIL. Licences have been issued to 6 small scale units and 1 joint sector unit for manufacture of micro-processor based systems for a total capacity of 1170 units per year with capacity in each licence being 50/250 numbers per annum, the limit being 20 in one case. The development of software packages and languages for the indigenous computer system are lagging far behind, despite the setting up of a National Centre for Software Development and Computing Techniques and three Regional Computer Centres so far. M/s International Computer Indian Manufacture (ICIM) which has reduced its foreign equity to 40% under the FERA has been licensed for manufacture of 100 numbers of medium sized computer systems ICL-2904 and a wide range of peripherals. The number of units to whom licences have been issued for manufacture of peripherals and the types and quantities are given in Appendix 3.4. Presently, production of peripherals in the country is marginal and almost all the peripherals are imported. Peripherals constitute a very substantial proportion of the cost of the total system, with attendant problems of maintenance of a variety of imported peripherals in India. Also, there is the problem of peripherals which have become obsolescent in the country of origin and have, therefore, gone out of production, consequent on a new generation of different systems coming in; this has made maintenance very difficult.

### 3.4 Control Instrumentation and Industrial Electronics

The production of control instrumentation and industrial electronics in the country was negligible in 1963 (Appendix 3.5). It was valued at Rs 10 crores per year in 1971; but it went upto Rs 82 crores in 1977. This sector accounts for about 20% of the total production in the area of electronics. It is a relatively capital intensive field for the most part; 75% of production comes from the organised sector. Small scale units however account for 50% of national production in the limited area of test and measuring equipment. 40% of the firms have annual outputs ranging from Rs 1 lakh to Rs 5 lakhs.

### 3.5 Consumer Electronics

The growth in the value of production of consumer electronic items in the country is indicated in Appendix 3.6. Currently consumer electronics accounts for 27% of the value of all electronics production but 80% of the consumer electronics production is concentrated on radio receivers and television sets. The share of TV sets is steadily increasing with the growth in the TV broadcasting services in the country, as seen from the table below:—

	1975	1976	1977
Share of radio receivers	55%	50%	44%
Share of TV sets	25%	30%	38%
	80%	80%	82%

The quantitative production of the major consumer electronic items in recent years is given in Appendix 3.7. Production of calculators and tape recorders has gone up; but their prices are three times the international prices. Production of radio receivers has been stagnating and the average price of radio has increased from Rs 160 to Rs 220 per set. The growth in production of record players and public address systems has been very modest.

### 3.6 Components

Components are the life blood of the electronics industry. Without adequate manufacture of high grade and reliable components the industry can never hope to grow in the long-term. The growth of components production is given in Appendix 3.8; the statistical profile and value of production are given in Appendices 3.9 & 3.10. Indigenous production of components has not kept pace with even the modest growth in other sectors of electronics; what little growth there is in the former is in value and not in volume; or in higher unit values. The lack of growth in this sector has been at the root of the tardy progress of all other sectors of electronics. Being a highly capital intensive industry, beset with high tariff duties on the import of raw materials and capital goods, low domestic demand and therefore low volume of production and high price, most entrepreneurs have been fighting shy of making investments in this area. In the absence of a large turnover, economies of scale do not operate. In most electronic industries, the world over, production of consumer grade components is regarded as a large volume by-product from the production of professional grade components which, otherwise, remain uneconomical to produce. Low volumes of production have also prevented investments in R&D and updating of technology. The equipment industry has, therefore, resorted to import of components increasingly every year and, with the high tariff duty to protect indigenous producers of components, the cost of production of equipment has gone up. The demand, production, export and import of components during the last 8 years are given below:—

#### Demand, Production, Export & Import of Components

(in Rs. crores)

1 Years	2 Total Demand	3 Production	4 Exports	5 Known imports through four major ports (c.i.f. value)	6 Estimated total imports (landed cost including duty)	7 Col. 6 as % of Col. 2
1971	47	39	1	N.A	9	19%
1972	55	42	1	N.A	14	25%
1973	63	51	2	N.A	14	22%
1974	84	72	3	N.A	15	18%
1975	98	75	4	N.A	27	27%
1976	108	80	4	13	32	30%
1977	138	91	5	16	52	38%
1978	160	117	6	12	49	31%

### 3.7 Exports

The export performance of the electronics industry is given in Appendix 3.11. If account is taken of the international increase in price levels, it must be considered disappointing. A welcome feature, however, is a good beginning made in the field of defence and communication equipment. Despite the incentives given to computer establishments for export of software and recognition of over 60 software generating houses in the country, the export of software during 1977 came up to the level of only Rs 2.5 crores out of which 25%,

30% and 33% were exported respectively to USA, Western Europe and USSR. World over, the computer industry is recording a growth rate of 15% per annum and the sale of hardware by US companies in 1977 amounted to Rs 24,000 crores. The cost of software required to service such a level of hardware would be around Rs 8,000 crores. In 1978, the export of software from India is estimated to have been around Rs 3 crores. Current export of consumer electronic items consists largely of radios and public address systems to developing countries in East and West Africa. The high prices of Indian products and the aggressive marketing of cheaper and better quality ones by South Korea and Japan have reportedly affected our exports to West Asia, North Africa and the European Economic Community.

### **3.8 Public Sector**

The performance of the major public sector undertaking in the area of Electronics is given in Appendix 3.12. Except for some real growth in Bharat Electronics Limited and Instrumentation Limited, Kota, the established units are more or less stagnant.



## CHAPTER 4

### TASKS AHEAD: BROAD STRATEGIES FOR DEVELOPMENT

With remarkable foresight, the Bhabha Committee had observed years ago that the electronics industry could only be developed as an integrated and inter-linked whole; its division into water-tight compartments like civilian and military applications, excepting where national security was involved, or between the public and the private sector, was not only irrelevant but also positively harmful to the development of the electronics industry, dependent as it is on a high degree of continuous innovation recognising only differences in technology and scale of operation. What was therefore needed was to plan the development of the industry on an integrated basis in four interlocked tiers, namely, systems, equipment, components and primary materials.

4.2 From the profile of the current status of the industry given in the preceding chapter, the sights to be set for new developments in electronics are clear. There is admittedly a base for primary materials like metals, resins and chemicals, but this needs to be developed to bring these materials up to the high purities and stringent standards which fast changing electronics calls for. This, however, is possible only in the long-term considering the quantities involved and the investments needed. Secondly, production of components is seriously lagging behind and has a long way to go particularly in the professional grades. It is necessary to rectify this situation, in the near future, to a stage where it can serve as a powerful stimulant to the growth of the electronics industry at the grassroots level. This sector, being relatively capital intensive, is subject to considerable economies of scale, as its costs and quality influence all the other areas of electronics. Thirdly, in the immediate future, the assembly of equipment which has come of age, needs to be expanded massively. This would inter alia, foster voluminous demand for components which would have the effect of bringing down their own costs besides those of the equipment into which they enter. One has to keep in view these perspectives in regard to the production of components and equipment. The supporting systems are then likely to grow as a natural result of the increasing use of electronic components in more and more types of equipment. The components in the field of electronics can be likened, to the building blocks for the superstructure which can then get built for the diverse applications of electronic technology in widely divergent spheres of economic activity.

4.3 While viable capacities for components are being built up, the immediate requirements of equipment and modern systems cannot be sacrificed, even if the country has to go in for the import of the required components for sometime. To close the door to such imports would jeopardise the future development of the components industry itself. Primary materials and capital equipment require a much longer time-frame to develop; any intervening restrictions on the import of components could only mean that we give a go by to the manufacture of indigenous equipment—which cannot be produced economically without components imports—and this would also inhibit the natural development of components. There is an inexorable economic logic to mass scale production of components arising from the demand for such components which can be generated only by their use in diverse types of equipment and systems. Eventually, the mass production of components would throw up new uses and new equipment and systems. Such indeed has been the pattern of development of electronics in the developed countries.

4.4 The chronological order of the above developments is not merely warranted by the normal historical trends in other countries. More importantly, its acceptance should be dictated by the prevalent socio-economic philosophy of decentralised industry and employment generation. As already noted, in the economic field, it is the equipment and systems sector that yields more direct employment than the manufacture of components.

4.5 It is worthwhile elaborating on the above. Decentralised production of textiles by the handloom weavers requires the supply of good quality mill yarn at reasonable prices. Even the village blacksmith requires steel which can be produced only in the large scale sector. Similarly, large scale production of electronic components and materials can generate considerable employment in the small scale sector in production of electronic items.

4.6 Indian technology in electronics needs to be updated. The systems and equipment sector can be updated within a very short time frame, based on import of components in the interim period; simultaneously the technology and volume of component production has to be raised and updated for obviating continued reliance on imports. The doors to foreign technology in the components field would therefore need to be opened wider than at present, consistent with the national policy, as otherwise the growth in the field of electronics would remain stunted. There is clearly need for liberalising induction of foreign technology in the components field.

4.7 Specifically, taking different areas of the application of electronic technology, consumer electronics has come some way; but certainly it has not reached its potential in a country like India with a population of 600 millions. There are limitations to the uninhibited growth of professional and industrial electronics. Therefore it would be a retrograde step to erect artificial barriers in the case of computers, mini or maxi, since barriers could jeopardise quality, safety and costs of the industrial production of materials which are the basic building blocks for the electronics industry. The telecommunication equipment sector which is showing signs of stagnation would need to stimulate actively electronic applications. Else, apart from denying the electronic industry a natural field of development, the country would be denying itself modern means of communication without which all economic activity would slide down. The needs of national security also require, for example, the urgent development of the capacity of production, on a massive scale.

4.8 Current exports of electronics from the country do not constitute even an infinitesimal share of global trade. Exports can be built up rapidly to a stage where they may lead to the growth of the electronics industry as a whole, to meet the rising world market demand.

4.9 National policies in electronics in the field of industrial approvals, imports, tariffs, and exports would therefore need a re-orientation, if the industry has to grow in all its segments. Besides policies, a whole array of supporting measures, fiscal and non-fiscal, would also be needed to cash in on the climate created by the re-orientation. The infrastructure in research and development, manpower training and placement and related aspects would also need to be kept in step. In the succeeding Chapters, the Committee has attempted to unfold the detailed measures and programmes in pursuance of these strategies to achieve rapid rates of growth.

4.10: The tasks for a major thrust in the development of the electronics industry are ambitious, but capable of realisation. The production targets for the next five years given at Annexure 4A to this Chapter would show what peaks have to be scaled. The nation cannot simply afford to stand by and wait if these tasks have to be fulfilled. Deliberate and positive steps are called for and have to be taken without any further loss of time.



## ANNEXURE 4A

## Estimated production for electronics industry

(in Rs. Crores)

Sector	1978-79 (Estimated)	1982-83 (Plan)	1978-83 (Plan)	1983-84 production as envisaged in 6th plan	Additional production possible in 1983-84	Total production 1983-84
1. Consumer electronics	161.0	310.0	1137.0	361.0	558.5	919.5
2. Mass communication	4.5	7.5	31.0	7.5	—	7.5
3. Control, Instrumentation & Industrial electronics	98.5	216.5	758.0	268.0	232.0	500.0
4. Communication equipment	137.0	235.0	908.0	274.0	176.0	450.0
5. Aerospace & Defence	95.0	120.0	525.0	130.0	—	130.0
6. Computers	12.5	47.0	131.0	62.0	344.0	406.0
7. Components & materials	113.0	254.0	878.0	310.0	535.7	845.7
Total	621.5	1190.0	4368.0	1412.5	1846.2	3258.7

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## CHAPTER 5

### INDUSTRIAL APPROVALS

A critical analysis of the present status of the electronics industry in the country shows that the investment, production and employment generation have not been as high as expected partly because of the elaborate structure for screening and rigid control on all matters connected which the licensing of expansions or new capacities and approval of projects in this sector. In other sectors of industry, the regime of industrial control has kept pace, at least to some extent, with changing needs and has been progressively relaxed, as the details in Appendix 5.1 would show. In electronics, on the other hand, the emphasis so far seems to have been more on regulatory rather than on developmental and promotional aspects. For example, the general industrial policy provisions regarding automatic growth, diversification and liberalisation of investment procedures and maximum utilisation of installed capacity for units coming within the ambit of licensing do not seem to have been applied to the electronics sector as vigorously as in other areas. Similarly applications from even small scale industries have been faced with the requirement of a three tier approval: that of the State Government, of the Development Commissioner for Small Scale Industries, Government of India and Department of Electronics. The Committee has therefore reluctantly come to the conclusion that this situation in electronics seems to have stifled initiative and enterprise, even in the case of small entrepreneurs and self-employed technocrats, by subjecting them to time-consuming procedures and multichannel scrutiny. Final approvals to projects and schemes have ranged over varying periods and upto as much as sixty months from the date of application (Appendix 5.2); even when approvals were granted, major modifications seem to have been made in many cases somewhat arbitrarily superseding the entrepreneurial judgment in respect of the techno-economic viability of proposals. Social control, in line with the national objectives of industrial policy, such as on limiting the growth of monopoly or dominance of multi-nationals is necessary and understandable; but what has happened is that, even where such factors did not come into play, there has been needless and rigid control, strangling growth and causing frustration.

5.2 The Committee is convinced—and so are most of the industry groups and professional experts whom it met—that if the growth of the electronics industry in the country has to gain momentum, the first step that would need to be taken would be to dismantle the present control structure to the extent that it does not subserve the accepted socio-economic objectives. The options are (a) total delicensing or (b) delicensing upto certain investment limits; in either case the MRTP/FERA companies being subject to licensing and the lines of production reserved for the small scale sector not being available to others in keeping with the current industrial policy. The Committee prefers the latter option as a first step.

5.3 The delicensing of investments upto Rs 3 crores (except for MRTP and FERA companies) announced last year has unfortunately not helped the electronics sector because it is subject to the conditions that (a) import of raw materials (excluding steel and aluminium) should not exceed 10% of turnover or Rs 25 lakhs a year whichever is less, (b) import of components in the 4th year of operation should not exceed 10% or 15 lakhs whichever is less and (c) units should not be located in metropolitan cities with a population of one



million or within municipal limits with a population of five lakhs according to the 1971 census. These stipulations have hardly any relevance to the electronics industry because almost all the raw materials for electronics have to be imported in the foreseeable future. Indigenous capacity for components is at present wholly inadequate; and the infrastructure for electronics development has still to come up outside the prescribed metropolitan and municipal limits. Also, the present delicensing gives no relief from the cumbersome procedures in obtaining either clearances for import of capital goods which are yet to develop for this sector in the country, or foreign collaboration which is necessary in this field for contemporary technology.

5.4 It is the assessment of the Committee that, except for MRTP and FERA companies and the public sector units, other investors in electronics are by and large unlikely to go in for projects or groups of related projects either in components or equipment with a capital investment in excess of Rs 10 crores. The situation in electronics is unlike that in heavy engineering, metallurgical and petrochemical sectors where usually investments are much heavier. The Committee would, therefore, recommend the raising of the present investment limit for delicensing from Rs 3 crores to 10 crores for the electronic industry so as to effectively delicense it without any of the existing preconditions on limits for import of raw materials and components or locational aspects. The exception in regard to MRTP/FERA companies and reservation of certain areas for the small scale sector, as now, may be retained, in consonance with the accepted socio-economic policy frame.

5.5 In a situation of partial delicensing, as proposed, the possibility cannot be ruled out of some units which were originally badly planned or were being indifferently managed going to the wall. This howsoever unfortunate would be inevitable, although, from the point of view of the long term health of the industry, a step in the right direction. However in those cases where protection for a clearly stated social purpose is called for, this could be extended through any one or more of the instruments of import control, tariffs, fiscal and financial measures from year to year. सत्यमेव जयते

5.6 In the opinion of the Committee, the existing and new units in the proposed delicensed area need only register the details of their activities with a single nodal agency, viz., the Department of Electronics except for small scale units where such an agency may be the State Director of Industries or the District Industries Centre. If such a registration is not to be licensing in disguise, it must perforce be automatic and not subject to any scrutiny; the financial and technical viability of projects or units should be left to be decided by the public financial institutions including the State Finance Corporations which in any case stake their funds and are now better equipped to undertake the responsibility of critically appraising the projects. The registration should have no other purpose than that of providing feedback data for monitoring and for rendering support to the fructification of projects and units, where sought or necessary.

5.7 If, as recommended, industrial licensing is dispensed with up to Rs 10 crores of investment, there would still be areas like foreign collaboration, import of capital goods and import of raw materials, components and tooling which would need attention before the projects or units can go on stream. In these areas, current procedures are unduly complex, time-consuming and subject to multi-point scrutiny, totally unsuited to the

situation in electronics where the rate of technological obsolescence is the fastest among all industries. Time lost is as good as the projects or the units not getting off the ground.

5.8 After a careful consideration of all the relevant factors for dealing with this situation, the Committee recommends that an Electronics Approval Board be set up in the Department of Electronics with Secretary, Department of Electronics as Chairman, Secretaries in the Ministry of Communications, Ministry of Commerce, Department of Industrial Development, Department of Defence Production, Planning Commission and the Department of Economic Affairs or their senior authorised representatives not below the level of Additional Secretary (or Joint Secretary where post of Additional Secretary does not exist) and the CCI&E as members. The Board should be delegated, in respect of electronics, all the powers which are now being exercised by the Licensing Committee, the Foreign Investment Board, the Capital Goods Committee, the Technical Development Fund Committee, the Committee on Joint ventures abroad and the import Licensing Committees within the jurisdiction of the CCI&E. In addition to applications from the delicensed sector, those from MRTP/FERA companies other than in the areas reserved for the small scale sector, as also from others involving investments above Rs 10 crores, would be within the competence of the Board to decide. This would ensure that all clearances in a package for any project in electronics are given at a single point, with the applicants having to deal with only one agency in the Government instead of having to cope with and chase a number of Departments and agencies for piecemeal approval at various hierarchial levels.

5.9 The Department of Electronics shall act as the Secretariat for the Board and assist the Board in the formulation of relevant policies and their implementation at the industry and unit levels. It is needless to say that while this single point scrutiny, wherever called for, would eliminate much of the time lost under current procedures, the Department of Electronics should also accept the responsibility for time-bound package clearance of the applications within a maximum period of 45 days.

5.10 In order to enable the Department of Electronics to clear the applications within the prescribed time frame, it is obvious that it should, in itself, have some guidelines and delegated powers at least in areas not involving foreign collaboration or joint ventures abroad to obviate submission of all applications to the Board. Towards this direction, the Committee recommends, in particular, that:

- (a) the applications for imports of raw materials, components and tooling for electronics industry be disposed of by the Department of Electronics, once the import policy frame for the year is cleared in principle by the Board;
- (b) formal references to the DGTD by the Department of Electronics on all matters connected with the Electronics industry be dispensed with (while DGTD has a positive role to play in engineering and chemical industries and can concentrate on it, the Department of Electronics, as the repository of technical knowledge, experience and expertise in the field of electronics should be unencumbered in its decision making. The need for the so called indigenous angle scrutiny by the DGTD would have no relevance in the context of the specialised raw materials, components, tooling and equipment required by the electronics industry where the Committee is recommending a series of import liberalisation).

5.11 It has also been found that in many cases nonviable and fragmented capacities have been sanctioned for the same product to a large number of units; this has not only eroded their profitability but has also made their cost of production disproportionately high. If it is decided to delicense the electronics industry upto Rs 10 crores except for MRTP/FERA companies without preconditions, this problem will automatically get resolved. Even in the case of MRTP/FERA companies, the Committee is of the view that all such cases where fragmented and nonviable capacities have been sanctioned in the past should be reviewed urgently by the Department of Electronics and firm proposals submitted to the Electronics Approval Board to rectify the situation. It is axiomatic to say that the per unit cost of expansion of a capacity to optimum level is much lower than what it would be if new capacity were to be set up ab initio; the gestation periods are also much shorter in such cases. In a country like India where capital is scarce, expansion of the existing capacities is the obvious thing to do. This will increase the ability of all such units to grow because it will broaden their market at home and abroad through lower costs and lower prices; such cases should receive priority in the matter of financing by the institutions.

5.12 The Committee recommends that the list of items reserved for the small scale sector be comprehensively reviewed annually (illustrative list attached at Annexure 5A to this Chapter) taking care to ensure that the items so reserved are spelt out with clarity and suit the genius of small scale operation. After reservation, the small units should be extended the maximum support on procurement of equipment and maintenance imports for fulfilling the production role assigned to them without having the smaller entrepreneurs or the self-employed technocrats having to run from pillar to post as seems to be the case at present.

5.13 Under the Industrial Policy Resolution, 'telephone and telephone cables, telegraph and wireless apparatus (excluding radio receiving sets)' are reserved for the public sector. This terminology has been interpreted hitherto in an all embracing manner to the total exclusion of the private sector's participation in the growth of production of telecommunication equipment, even where the public sector programmes have been clearly inadequate to meet the fast growing requirements of the country. The Committee is of the view that, in this category, the private sector could supplement and augment production in the public sector substantially. The Committee therefore recommends that this restriction be selectively removed so that there is national participation in the challenging task of meeting the overall requirements of telecommunication equipment in the country and consequential changes made in the Industrial Policy Resolution.

5.14 In the case of telecommunication equipment, the Department of Electronics, in consultation with the Ministry of Communications, where necessary, should ensure that allocation of frequencies (only for manufacture and not operation) is done more or less automatically and does not tantamount to licensing, for the delicensed sector; illustrative lists of telecommunication items which the private sector could be encouraged to produce are given at Annexure 5B to this Chapter. The list should be carefully scanned by the Department of Electronics in consultation with the Ministry of Communications so that suitable guidelines could be issued on frequency allocation, on specifications, production standards etc.

5.15 In regard to foreign collaboration, unlike other industrial sectors, the current procedures in electronics have put the whole field of electronics under the category 'to be considered on merits'. The Committee recommends that there need be only a list of banned items/processes for foreign collaboration, for clearly stated reasons, leaving the entire residual area free for foreign collaboration. This would have the merit of updating our electronics technology which, as already stated, has a very high rate of obsolescence. The Committee would recommend that full authority be vested in the Electronics Approval Board to examine and sanction proposals for foreign collaboration, as well as equity participation, even if this involves some departures from the existing guidelines keeping the specific requirements of the electronics industry in view, but not at the cost of national interest. It must be recognised that the world trade in the transfer of high technology amongst the developed countries is growing every year and we should not shut our doors to its import in an area like electronics which calls for a great deal of sophistication. The long-term aim should, however, be to improve on the imported technology through a strong indigenous R&D base within the country so as to ultimately reach a stage where the improved technology can also be exported. This naturally is a time consuming process but there is little doubt that we have the capacity to do this, besides developing new technologies ab initio.

5.16 The Committee was informed that, in the past, provision of a 'buy back' arrangement in the foreign collaboration was being insisted upon in most cases. The Committee is of the view that while this is a very desirable feature of any collaboration arrangement, and every effort should be made to get such a stipulation incorporated in the agreement, it should not be made obligatory, because it may not be possible to get the licensor to accept such a stipulation in an otherwise favourable collaboration arrangement. Similarly, there should be no insistence on providing for an export obligation except in those cases where special considerations warrant such a course of action. All existing arrangements which have not been able to make much headway so far, for one reason or the other, should be reviewed by the Department of Electronics in the light of the recommendations if accepted by the Government.

5.17 There are two other important suggestions specific to the electronics industry. These are:

- (i) It should not be necessary for every production unit in the electronics industry to integrate its production vertically to uneconomic levels in trying to produce every raw material, part or component. Even large projects in the electronics industry must be permitted to be established at any intermediate stage of production irrespective of other considerations so long as they can reduce the overall import content and the cost of the product in the domestic market.
- (ii) The Committee would like to reiterate that a sophisticated industry based on the techniques of modern electronics cannot, at this stage of our development, be located in remote areas which suffer from lack of infrastructure. Also, as a substantial portion of production would be exported, location of units in this sector have perforce to be in or around centres covered by domestic/international air routes (electronics cargo is usually airfreighted in export). Besides, this industry does not cause pollution, nor does it make a sizeable draft on scarce

resources such as urban space, water, power, drainage and transportation facilities. It can also provide employment to the educated unemployed in urban areas. Therefore, in respect of the electronics industry, the existing licensing/registration policy on the location of new industrial units needs to be relaxed and electronics units permitted to come up in the vicinities of cities also.

5.18 The Committee feels that if the recommendations made above are accepted for early implementation, the resultant freedom from the rigours of the existing controls would in itself create a climate in which the tempo of investment, production, exports and employment generation in the field of electronics would get a much greater impetus. This would be a much surer guarantee of self-reliance in this sector than the existing mistaken notion that the kind of regulatory control which has been operating is conducive to it and it will do away with the problem of unimplemented letters of intent/industrial licences caused at times by uneconomic and arbitrarily fixed capacities for equipment and components which have in many cases not allowed the more resourceful entrepreneurs to make any headway. Of course, it goes without saying that a number of positive support measures would be needed to ensure a rapid growth of electronics ; these are specified in the succeeding chapters of this report. If the electronics industry in the country has to catch up with that of the industrial economies of the world in the foreseeable future, it would merit a special status and special priority in the approach to and means of development. The latter, it must be stated, need not and will not involve heavy financial public outlays by the Government.



## Illustrative list of reservation for small scale sector

Sl. No.	Item presently reserved for small scale sector	Items & activities proposed for reservation for small scale sector	Remarks
1.	Radio/Car Radio (low cost upto Rs 250/- each)	Assembly of Radio/Car Radio (low cost upto Rs 250/- each)	
2.	TV antenna	TV antenna for domestic TV receivers	
3.	TV Tuners	TV Tuners	
4.	TV Games	TV Games	
5.	TV Booster Amplifiers	TV Booster Amplifiers	
6.	Radio and TV coils	Radio and TV coils IFTs	At present there are two entries namely for Radio and TV coils and IFTs
7.	Amplifiers for entertainment and Public Address Systems	Amplifiers for entertainment and Public Address Systems	
8.	Assembly of Loudspeakers	Assembly of Loudspeakers	
9.	Electronic Cigarette Lighters	Assembly of Electronic Cigarette/Gas Lighters	The existing nature of reservation forbids large scale sector entering this area even if they wish to undertake manufacture of component parts
10.	Inverters and convertors upto 500 amps	Inverters and convertors upto 500 amps	
11.	Regulated DC power supplies (upto 0.01% regulation)	Regulated DC power supplies (upto 0.01% regulation)	
12.	Electronic Fan Regulators	Electronic Fan Regulators	
13.	Dimmers and Twilight Switches	Dimmers and Twilight Switches	
14.	Digital Clocks	Assembly of Digital Clocks	Basic components required for assembly are manufactured in the organised sector

15. IF Transformers	Included in item No. 6
16. Air trimmers for professional use	Air trimmers for professional use
17. Transistor Headers	Transistor Headers
18. Telescopic Aerials for Radio Receivers	Telescopic Aerials for Radio Receivers
19. Battery Eliminators	Battery Eliminators
20. Electronic Flash Gun	Assembly of Electronic Flash Gun
21. Hearing Aids	Assembly of Hearing Aids

**Additional items suggested for inclusion in the list of items and activities reserved for small scale sector**

1.

Assembly of TV Receivers less than Rs 2000/- per set.



The existing manufacturers in the organised sector may be allowed expansion of capacities provided assembly of additional TV sets is done in the Ancillaries/Small Scale Sector and only quality control, testing and marketing is done by organised/public sector.

2.

Assembly of low cost calculators.

Non-slide rule type, basic value upto Rs 175/- and slide rule calculator basic value upto Rs 450/- are deemed low cost calculators.

**Illustrative list of telecommunication equipment which can  
be taken up for production in private sector**

**1. In Small Scale Sector:-**

Assembly of

- (i) various power supplies designed, manufactured and supplied to various users;
- (ii) accessories e.g. cords, plugs, bay instruments for speech signalling;
- (iii) power units for Teleprinters;
- (iv) power units for PAX and PBX boards; and
- (v) telecommunication console panel.

**2. In all sectors:-**

- (a)
  - (i) Installation and maintenance instruments for telecommunication (presently large number being imported);
  - (ii) Electronics PAX and PABX (telephone transmitters and receiver inserts to be guaranteed by manufacturers and certification of compatibility from P&T);
  - (iii) Cordless exchange;
  - (iv) Telephone cables;
  - (v) Telephone attachments like answering machines, dialler attachments, subscriber metering systems, STD barring facility and telephone amplifier;
  - (vi) Telephone instruments (including Magnetos, CB, auto and push button electronic and rotary type, intrinsically safe and fancy types);
  - (vii) Telex attachment to teleprinters;
  - (viii) PBX;
  - (ix) PABX;
  - (x) PMBX; and
  - (xi) Electronic telex exchange.
- (b) Small capacity multiplexing equipment upto 24 channels.
- (c) Telemetry and Data logging equipment.
- (d) Data Modems and Digital Communication Instruments.
- (e) Instruments (field strength meters, visibility meters, distance measuring equipment, telephone network and monitoring instrument).
- (f) Satellite TV Direct Broadcasting Receivers.
- (g)
  - (i) RF paging equipment and wireless Microphones;



- (ii) Electronics toys and gadgets using Remote Control, such as Remote Control Aeromodels;
- (iii) Walkie-talkie sets of power upto 300 mw and other transreceiver sets upto a power of 3 watts in the Citizen's Band; and
- (iv) Wireless sets in VHF with power limitation of 15 watts and antenna height limitation of 10 meters for fixed stations; power limitation of 15 watts and antenna height of 3 meters for mobile stations; power limitation of 2 watts with built-in antenna for walkie-talkie sets; and power limitation of 300 mw with built-in antenna for handie-talkie sets.



## CHAPTER 6

### IMPORTS AND TARIFFS

Import policies and customs and excise tariffs, used singly or in combination, can be powerful instruments for fostering industrial growth with competitive strength on the one hand and a reasonable degree of protection in the interim to domestic industry till it reaches viability on the other. These measures have been used in several areas of our industrial sector with success. However, in respect of the electronics industry, the Committee has observed that a number of contradictions in the import policy and tariff structure have continued to exist over the years, impeding its rapid growth.

6.2 The status of the electronics industry in the country at present, by international standards, is that the infrastructure in capital equipment and basic raw materials is practically non-existent and there are large gaps in indigenous capabilities for the manufacture of components and tooling, particularly of the professional grade. As against these negative factors, on the positive side, capacities for assembly of electronic equipment and end-products have already been built up and could be rapidly developed further, particularly in the context of the recommendation for delicensing of industrial approvals upto Rs 10 crores investment, if accepted. Also, we have today in the country a large trained manpower to engineer electronic systems required for monitoring and controlling various processes. Therefore, the import/tariff policies and procedures need to be restructured with a view to ensuring that the required electronic equipment as well as systems of appropriate reliability are made indigenously available within a reasonable time frame. Concurrently with the above, concerted efforts have to be made to bring down the prices of finished products so that both the internal and external markets for them are stimulated.

6.3 The objectives of import policy to be adopted for electronics are, therefore, clear, namely,

- (i) to promote indigenous manufacture of components;
- (ii) to promote indigenous large scale assembly of equipment and end-products including integrated systems such as computers, communication and control systems;
- (iii) to free the import of capital goods, intermediates, components, tooling and basic raw materials, which are not likely to become available from indigenous sources in the foreseeable future, from the high incidence of taxes and import restrictions as far as possible, consistent with the need for protection of indigenous industry where, in any particular sector or segment, it is called for; and
- (iv) to avoid multi-point imposition of duties which makes the end-product unduly expensive resulting in a shrinkage of demand.

6.4 With these objectives in view and after elaborate and detailed discussions with the various sectors of the electronics industry, the Committee would commend the following import policy for electronics;

- (i) import of fully assembled and ready-to-use electronic equipment, excluding test equipment, be strictly restricted, except in certain specified cases where the

- domestic requirements do not justify the setting up of fabricating capacity or assembly units (illustrative list at Annexure 6A to this chapter);
- (ii) capital goods not available indigenously be placed on Open General Licence, as far as possible (illustrative list at Annexure 6B to this chapter);
  - (iii) test equipment, tooling, components, professional grade in particular, and raw materials be also placed on Open General Licence except those which are being manufactured or are likely to be manufactured in the country in the short-term and warrant protection in the national interest; the import of the latter however being restricted (illustrative list at Annexure 6C to this chapter);
  - (iv) items on restricted list be eligible for automatic licensing at 110% of previous year's consumption of imported items by value, at 150% for small scale sector for components, and supplementary licensing subject to the prescribed scrutiny (the Department of Electronics shall act as the nodal agency for this purpose);
  - (v) wherever feasible, pack values be fixed for import as percentages of the ex-factory price of the end-product, laid down from year to year, to regulate automatically the import content. This method allows entrepreneurs the flexibility to choose the composition of the pack and progressively increase the real value added and thereby speed up the pace of indigenisation; and
  - (vi) no restriction be placed on the import of second hand plant and testing equipment except to the extent of the usual certification about the good condition, residual life and depreciated value of the equipment from a chartered engineer. Because of very rapid developments and consequently very high rates of obsolescence in the highly advanced countries, plant and equipment of fairly recent vintage, for the electronics industry specially, are reported to be available from advanced countries at prices well below the prevailing prices of brand new equipment; we can cash in on this situation by bringing down capital costs of new electronic projects; but time is of the essence of such import procurement and no procedural bottlenecks should be allowed to come in the way.

6.5 In the implementation of the suggested import policy, problems may arise in the identification of professional grade components and raw materials like metal foils, synthetic resins and chemicals (most of which could come under OGL as for example the representative items in Appendix 6.1) for customs clearance and for preventing diversion in end-use. With a view to obviate this problem, it may be stipulated in the import policy that the actual user-importer gives a declaration to the customs that he is a licensed or registered manufacturer of professional grade equipment or electronic components, as the case may be. If necessary, the Department of Electronics/Customs can effect a highly selective post-check or carry out investigation into specific complaints so as to curb any attempt at abuse.

6.6 In the residual areas, where import licensing of capital goods, test equipment or tooling is still required, in view of the need to develop the Electronics industry on a priority basis and considering that the annual outgo of foreign exchange on the electronics goods is of a comparatively small order presently not exceeding Rs 10 crores, free foreign exchange should be made available to take care of such requirements; in that case it should not be necessary to have recourse to the existing procedure of clearance by the Economic Adviser.

Department of Economic Affairs and other agencies regarding allocations under various aid and loan credits under intergovernmental agreements.

6.7 For capital equipment of value above Rs 10 lakhs, the existing procedure stipulates that the project unit should advertise such capital goods and wait for 45 days for response from indigenous sector to come in, before the application is cleared. The Committee considers that this advertisement procedure is not relevant to the electronics industry where, in any case, at present the bulk of the capital goods has to be imported, it is of relatively low value, and where the rate of technological obsolescence hardly allows of many standardised capital goods being in production in India or elsewhere, the capital equipments being more designed around a particular process or technology and custom made to the state of the art. The advertisement procedure may therefore be dispensed with.

6.8 The framework of import policy recommended above would still leave residual areas of import-linked export obligation, the Registered Exporters Policy for imports and the import policy for export processing zones and export-oriented hinterland electronic units. These areas are dealt with in the Chapter on 'Exports'.

6.9 The existing import tariff structure applicable to input materials and components in the area electronics does not subserve the interests of a fast growth in electronics. In fact, so far, for some reasons, even the rationalisation of tariff structure effected in other sectors of industry (e.g engineering) has not been applied to electronics in any significant measure. The rationalisation in other sectors is based on low rates of import duties (about 40% ad valorem) on basic raw materials, an intermediate rate (upto 75%) on components and semi-finished products and the highest rate (about 100%) on finished products. In electronics, at present the rates of duty on raw materials go to 237% ad valorem; components attract rates of duty upto 137% in some cases, which are lower than those on raw materials; and some items of equipment are subjected to rates of duty (40% to 60%) even lower than those on components (representative list in Appendix 6.2). The Committee is of the view that the irrationality in customs duty structure is a deterrent to the development of the electronics industry in the country. This situation therefore needs to be rectified immediately.

6.10 After careful consideration, the Committee recommends the following structure of import duties (including auxiliary and countervailing duties) for items of electronics:

- (a) capital goods, test equipment, tooling, raw materials and components placed on Open General Licence be wholly exempted from duty for the reasons stated in para 6.2 above.
- (b) items, not placed on OGL be assessed to duty at 100% ad valorem except for specified items which may need higher duty protection because of their nascent development or for any other reason depending on cost studies and in the national interest; however, the industry should be put on notice that tariff protection would be gradually reduced so that they might take steps to reduce their cost of production and build up their competitive strength in a definite time frame, of say 3/5 years, the protective duty structure being subject to periodic reviews.

The Committee recommends that the Department of Electronics should draw up the comprehensive tariff rate structure under the above categories for approval by the Ministry of Finance.

6.11 The Committee has been informed that customs clearance at times creates problems because of difficulties in the interpretation of terminology. It is suggested that the clarifications given by the Department of Electronics be accepted as final by the Customs Authorities, and this clarification be unambiguous and as detailed as possible.

6.12 Currently, picture tubes for TV and Calculator chips are canalised through the Electronics Trade and Technology Development Corporation (ETTDC). If the above recommendations of the Committee are accepted, there would be no need for any canalisation. ETTDC can, however, continue to play a useful role, purely as a service agency, for small scale users at the latter's option.

6.13 A reference has been made earlier to the effect of multi-point imposition of duties on the cost of production of end-products, a subject which the Jha Committee had dealt with in some detail. The stimulation of demand for electronics, a major factor for the industry's growth prospects, would require that costs are contained all round through avoidance of such multiple taxation; (typical examples of this are given in Appendix 6.3). The Committee would recommend that a fixed set-off, worked out on an empirical basis, be given to reduce the cascading effect of these levies. It is also the considered view of the Committee that the existing area or quantum of central excise duties on electronics goods (Appendix 6.4) should not be enlarged for three years by when a major thrust in electronics production is bound to take place if the package of recommendations contained in this Report is accepted.

6.14 Finally, it is necessary that once the import/tariff policies are formulated, they should have a stable tenure of at least three years, lest apprehensions of change should act as a psychological barrier to the growth of this industry.

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**Illustrative list of electronic equipment whose import is to be strictly restricted**

1. List of strictly restricted items	recommended rate of import duty
All consumer electronic equipment fully assembled and ready to use including, Radio Receivers, Transistor Radio Receivers, TV Games, Electronic watches, AM/FM Radio Receivers, Amplifiers, Car Radios, Tape recorders, Car Cassette Players, TV receivers, Record players, Record changers, Intercom equipment, Calculators as well as kits/ready to assemble sets thereof	200%
<b>2. List of Restricted items</b>	
(a) All professional electronic systems and equipment fully assembled and ready to use as well as kits/ ready to assemble sets thereof	100%
(b) Electronic communication and control systems fully assembled and ready to use as well as kits/ready to assemble sets thereof	100%
(c) Automatic data processing machines, including computer systems (in kits/ready to assemble or fully assembled and ready to use) of value	
(i) below Rs 50 lakhs	100%
(i) Rs. 50 lakhs and above	40%*

\*See chapter on Computers.

**Illustrative list of capital goods for electronics industry not available  
indigenously and to be placed under open general licence.**

**A. General**

1. High precision eyeletting machines with automatic feed machines for eyelets with shank dia less than 0.065" for contact assembly.
2. High precision semi-automatic rivetting machines for contact assembly with rivet shank dia, less than 0.125".
3. Compression rivetters with quick return mechanism.
4. Capacitance discharge welding machines with power supply and weld head with maximum energy setting upto 500 watt seconds suitable for precious metal welding.
5. Hot-tip tweezer welder for special contact soldering using preformed solder.
6. Miniature pneumatic/electrical table mounting off set printing machines for product printing.
7. Automatic precision Winding/Machine for Plastic film capacitors.
8. Temperature Cycling programmed Heat-treatment Oven for heat stabilisation of professional grade plastic film capacitors.
9. Metal spraying equipment for Metallised Plastic film Capacitors.
10. Automatic welding machine for termination of plastic film capacitors (Metallised and foil types).
11. Automatic Tape Wrapping Machine for plastic Film Capacitors.
12. Dip Coating equipment for Capacitors.
13. Automatic Printing/Marking equipment.
14. Automatic solder dipping machine with programmed feeds.
15. Automatic Bar cut-off with stripper attachment.
16. Automatic lead welding machines with programmed lead assembly stations and automatic solder adopter station.
17. Automatic Terminal Capping machine.
18. Automatic Resistance value performing machine by helix cutting.
19. Colour coding machine with auto feeder.
20. Automatic sleeving machine for Capacitors.
21. Automatic Stitcher and Welder for electrolytic capacitors.
22. Wire wrapping machine for wiring power electronic equipment.
23. Double sided lapping machine for brittle materials like silicon.
24. Annular wafering machine for brittle materials like silicon.

25. Float zone and czochralski crystal growth equipment for growing semiconductor single crystals.
26. Epitaxial Reactors for deposition of Semiconductor materials.
27. Micro file printing machine.
28. Precision pin routing and high speed drilling machine.
29. Photographic aids for printed circuit board manufacture and assembly.

**B. Machinery required for the manufacture of Capacitors.**

1. Automatic winding machine.
2. Ultrasonic Solder Coating Machine.
3. Automatic welding machine with adjustable feeding tube.
4. Thermal Press/Heat Press.
5. Automatic marking machine.
6. Automatic coating machine.
7. Automatic taping machine.
8. Automatic slitting machine.
9. Printing automats.
10. Wire cutting, feeding automats.

**C. Machinery required for the manufacture of Resistors.**

1. Automatic Vacuum Metallizing (Fluttering machines) for coating.
2. Crack Carbon coating machines with automatic control.
3. Spiralling machines high speed - SILNER (for groove cutting)
4. Sorting automats.
5. Lead forming-fixing-lacquering testing automats complete with instrument control.
6. Bandolering.
7. Automatic resistor painting/coding machine.
8. Automatic resistor capping machine.
9. Automatic resistor lead welding machine.

**D. Machinery required for the manufacture of Semi-Conductors.**

1. Automatic Computer controlled test.
2. Ion Implantation machine 300 KW for doping semiconductors.
3. Bonders, semi-automatic, die, wire, thermo-compression, ultrasonic etc.
4. Vacuum Evaporator/sputter unit Min. pressure  $10^{-8}$  tons.



5. Dicing Saw/Wafer Saw with depths adjustable 0.0001".
6. Diffusion/Conveyor Furnance +/- 0.5°C control 250-1300°C
7. Epitaxial/CVD Reactor with RF Generators.
8. Stop & Repeat Cameras with positional, capacity 2 x 10<sup>-5</sup> inch.
9. First Reduction Camara with reduction capacity upto 50
10. Photoresist Spinner upto 10,000 rpm.
11. Mask aligner for exposing upto 3" Wafers D-60 sec. exposure time.
12. Automatic Wafer Prober for 3" wafers.
13. Printing Machine for printing on semiconductors.
14. Handlers for handling devices for optimum utilisation of test systems.
15. Plasma Etchers for dry etching of silicon dioxide.
16. Spray, develop and rinse stations.
17. Sealing/Welding Machine 0.5-2K/hr. speed.
18. Laser Trimmers.
19. Curve Tracer.
20. Screen printers for printing pallets or wafers.
21. Wafer scribes for wafer cleaning.
22. Transfer Moulding Press 25.75 tons.
23. Moulds for plastic devices.
24. Lapping machine.

**E. Machinery required for the manufacture of Electro-mechanical Components.**

1. Automatic eyeletting/rivetting machine.
2. Stereozoom microscopes.
3. High speed automatic coil winding machines.
4. Intricate tools/moulds.
5. Transfer moulding presses for encapsulation upto 5T capacity.
6. Calibrators for measuring instruments.

**F. Machinery for manufacture of multilayer Ceramic Capacitors and Carbon Film Resistors**

1. Ceramic Caster
2. Automatic Stripping and Framing Machine
3. Electrode Screening Machine (Automatic)

4. Automatic Punch & Laminating Machine
5. Cutting Machine
6. Silvering and End Termination System
7. Automatic Coating Machine
8. Automatic Taping Machine
9. Automatic Tape Packing Machine
10. Automatic Sorting Machine
11. Carbonising Machine/Oven
12. Winding Machines for deflection yoke coils and half rings



**Illustrative list of test equipment, tooling, components, professional grade in particular and raw materials to be placed on the restricted list for imports**

	<b>Recommended rate of import duty</b>
1. Test, measuring and recording instruments:	100%
(a) Mesuring instruments like electronic multimeter, voltmeter, frequency meters etc (to be specified in detail)	
(b) High frequency oscilloscope below 100 MC/S	
(c) Contact resistance meter above 100 Milli ohm	
(d) Wheatstone bridge, Kelvin bridge, Capacitance bridge, RLC bridge	
(e) TV pattern generators	
2. Antennae (all types)	100%
3. Audio magnetic tape in reels, cassettes, Jumbo rolls, cartidges and pancakes	100%
4. Cassette without tape (c,-o)	100%
5. Ceramic cartridges and stylus for record players/changers	100%
6. Coated tantalum anodes for capacitors	100%
7. EHT Transformers for TV receivers above 36 cm	100%
8. Ferrites—	
(a) Antenna rods for radio receiver	
(b) Pot cores of sizes 18 x 11 mm & 26 x 16 mm	
(c) Toroidal cores of type T-10, T-27, T-30 and T-45	
(d) UI/UU cores	
9. Linear Integrated Circuits types CA 3085, CA 3085A, CA 3028A, CA 3020, CA 3020A and CA 3021	100%
10. Loudspeakers (cone type) below 12"/unit horns	100%
11. Microphones for public address systems	100%
12. Precalcined ferrite powder	100%
13. RF/IF coils for radio and TV	100%
14. Silicon diodes/rectifiers (except Schottky diodes)/bridges/stacks, 200 mA and above upto 500 amp, excluding auto diodes	100%

15. Sub-assemblies, modules or 'room temperature vulcanised sandwiches' made of/on diffused semiconductor chips	100%.
16. Thyristor silicon control rectifiers (convertor grade), above 30 amp and upto 150 amp	100%.
17. TV deflection coils for picture tubes above 36 cm size	100%
18. TV tuners	100%.
19. Discrete silicon semiconductor devices including silicon power semiconductor devices	100%
20. Auto diodes of 15 and 25 Amps rating	100%
21. Diffused wafer/chips for semiconductor industries including ICs	100%
22. Etched/formed aluminium foil	100%.
23. Ferrites	100%.
24. Metal Film Resistors	100%.
25. Microphone cartridges	100%.
26. Microwave components of all types	100%.
27. Paper cones for loudspeakers	100%.
28. Piezo electric elements	100%.
29. PCB mounted pulse transformers	100%.
30. Printed circuit board	100%
31. Selenium rectifiers/plates/stacks	100%
32. Strip wound synchronising transformers	100%.
33. Tape deck mechanism	100%
34. Tape wound toroidal cores	100%
35. Testing and cleaning cassettes	100%
36. Transistor headers	100%.
37. Wave traps and coupling	100%.
38. Wire wound resistors	100%.
39. Copper wire/strips (oxygen free types)	100%.
40. Heat sinks for semiconductor industry	100%
41. Screen netting (60 mesh)	100%.
42. Professional grade components :	100%.



**(i) Diodes:**

CA 44/IN914/IN4148  
CA 52/1 N903  
CA 57/1 N903A/1 N4152  
CA 59/1 N916A  
CA 72/1 N4089  
CA 74/1 N3654/1 N4151  
CA 77/1 N3606/1 N4152  
CA 79/1 N3731/1 N449  
CAZ 5.1A/1 N3511/1 N52318/1 N7514  
CAZ 30.0A/IN/3529/1 N52568/1 N972  
CAZ 4.3A/1 N3509/1 N5229B/1 N749/1 N749A  
CAZ 5.6A/1 N3512/1 N5232B/1 N752A  
CAZ 4.7A/1 N3510/1 N5230B/1 N750A  
CAZ 7.5A/1 N 3515/1 N526B/1 N755A  
CAZ 8.2A/1 N3516/1 N5237B/1 N756A  
CAZ 16A/1 N966/1 N5536/1 N4110/1 N5221/  
BZX83C16/BZX97C16; GO-3  
EC406/silicon rectifier device of 6 amps; rating in DO-4 Package  
FA412/silicon rectifier device of 12 amps, rating in DO-4 package

**(ii) Transistors:**

2N 706  
2N 718A  
2N 720A  
2N 869  
2N 911  
2N 918  
2N 930  
2N 142  
2N 1613  
2N 1711  
2N 1890  
2N 2102  
2N 2218  
2N 2218A  
2N 2219  
2N 2219A  
2N 2221  
2N 2221A  
2N 2222  
2N 2222A  
2N 2369A  
2N 2904  
2N 2904A  
2N 2905  
2N 2905A



2N 2906  
2N 2906A  
2N 2907  
2N 2907A  
2N 3019  
2N 3054  
2N 3055/MJ2801/KSD3055  
2N 3251A  
2N 3866  
2N 4033  
2N 5071  
2N 6371  
BD 115  
ECPO 55/ECNO 55  
BFW 10  
BFW 11  
BFW 61

**(iii) Thyristors (SCRs)**

26TB44  
26TB8  
26TB10  
685  
688  
SS690  
SS692  
SS694



**(iv) Connectors :**

- (a) Printed circuit board connectors: सत्यमेव जयते
- (i) tuning fork type in 10, 12, 16 & 22 contacts
  - (ii) plug/receptacles harp type in 11, 25 & 33 contacts.
  - (iii) pin and socket type in 13 & 31 contacts
- (b) Rack and panel connectors :
- (i) blue ribbon type in 8, 24 & 32 contacts
  - (ii) subminiature mini rack type in 9, 15, 25 & 50 contacts
- (c) Radio frequency connectors :
- (i) (a) BNC straight plug type US-88/U  
to UC-88C/u and M39012/16-0001
  - (b) BNC straight plug type UG 260/u  
to UG260-F/u and M39012//16-0002
  - (ii) (a) BNC square flange socket UG-290/u  
to UG-290 B/u and M39012/22-0001

- (b) BNC square flange Plug UG 291/u  
to UG-291B/u and M39012/18-0002
- (iii) BNC straight Jack type UG89/u to  
UG-89/D/u and M39012/17-0001
- (iv) BNC bulk head socket type UG1094/u  
to UG-1094B and M39012/21-0002
- (v) BNC bulk head socket type UG-625/u  
to UG-625/CU and M39012/21-0001
- (vi) TNC straight plug type M39012/26-0001
- (vii) TNC square flanged panel sock M39012/32-0001
- (viii) TNC bulk head socket M39012/31-0001
- (ix) UHF straight plug PL 259/PL295A
- (x) UHF square flange socket SO-239
- (xi) UHF right angle Plug
- (xii) N straight plug UG-21/u to UG-21 H/U and M39012/01-0002
- (xiii) N square flanged socket UG58/U to UG58B/U and M39012/04-0002
- (xiv) N square flange Jack UG22/U to UG-22F/U and M39012/02-0005
- (xv) DIN coaxial 50 ohm 1.8/5.6 plugs and sockets
- (xvi) DIN coaxial 75 ohm 1.5/5.6 plugs and socket
- (xvii) SMA straight plug for flexible cable and M39012/56-3007
- (xviii) SMA square flange socket and M39012/60-3001
- (xix) SMA right angle plug for flexible cable, and M39012/56-3007
- (d) Audio multipin connector of 5 contacts/pins
- (e) Multipin circular industrial and military connectors
  - (i) MS 3102 R in 10 SL, 14S, 1SS, 18 and 22 shell size  
MS 3106 R in 10 SL, 14S, 16S, 18 & 22 shell size  
MS 3100 E in 14 S shell size  
MS 3101 E in 14 S, 20, shell size  
MS 3102 E in 14 S, 28, shell size  
MS 3100 R in 10 SL, shell size  
MS 3101 R in 10 SL  
MS 3108 E in 14 S, 28
  - (ii) Bayonet coupling sealed circular connector  
62 GB 14 E 12-3 P and MS 3114  
E-12-3P 62 GB 16 F 12-3 S and  
MS 3116-F-12-3P
- (v) **Resistors**
  - (a) Insulated metal oxide resistor of 0.5 Watt power rating in values 10 ohms  
to 1 Mega-ohm

- (b) Non-insulated wire wound resistors of following types:  
2.5 Watt power rating of values 10 ohm to 10 Kilohm  
6.0 Watt power rating of values 1 ohm to 20 Kilohm  
9 Watt power rating of values 1 ohm to 60 Kilohm  
10 Watt power rating of values 10 ohm to 24 Kilohm  
12 Watt power rating of values 1 ohm to 100 Kilohm  
15 Watt power rating of values 10 ohm to 6.9 Kilohm  
25 Watt power rating of values 10 ohm to 18 Kilohm  
50 Watt power rating of values 10 ohm to 35 Kilohm  
100 Watt power rating of values 10 ohm to 91 Kilohm

**(vi) Capacitors**

- (a) Non-hermetically sealed fixed polystyrene capacitors  
-63 Volt rating in values from 100 pico farad to 150000 pico farad  
-250 Volt rating in values from 100 pico farad to 68000 pico farad
- (b) Non-hermetically sealed metallised Polyester fixed capacitors flat and oval type, wrap and fill construction  
-Upto 630 Volt D.C rating in capacitance range 0.01 to 1 Micro farad
- (c) Non-hermetically sealed metallised Polycarbonate capacitors flat and oval type, wrap and fill construction  
-63 Volt rating in values from 0.1 to 10 Micro farad

**(vii) Dry Reed Switches**

- (a) DRR-1/MR-906/MR-908/Mr-956/MR-958/DR-113/DR-114/63-4321-1/MRA-203/DRA-200
- (b) MTRR-2/MR-458/2026/DR/300/MM/R-090/560-2/TRA-291/DRD/221/FOR-7
- (c) DGA-124/N/DGD-090/DGD-106/DGD-135/ORD-100 DK

**(viii) Magnetrons**

BEL-7008/YJ1010

**(ix) Cathode Ray Tubes**

- (a) BEL 130C1P1/5ABP1/DG 13.34/DB 13-134
- (b) BEL 180C1P7/7MP7
- (c) BEL 260C1P7/10LP7/10M166P7
- (d) BEL 180C2P7/7ABP7



## FISCAL AND FINANCIAL MEASURES

Industrial investment and production is very sensitive to the financial and fiscal policies of the Government. It is more so in electronics industry involving as it does sophisticated technology with risk of unpredictable obsolescence caused by very rapid technological developments. Entrepreneurs in electronics are naturally keen to get adequate financial returns within a relatively shorter time frame after taking into account the cost of technology and management, domestic and international market price, the duty structure and tax provisions. Electronics being the pace setter in advanced economies, there is no dearth of entrepreneurs or finance in the electronics industry which is also closely knit with advances in basic services like Defence and Communications, primary industries like petroleum and coal, steel production and other such priority industries. But such is not the situation in India and the concept of rapid development of the electronics industry as a national priority is yet to have an impact on the fiscal and financial policies.

7.2 The break up of the total value of electronics production in our country in recent years is as follows:

Communications	20%
Defence & Aerospace	15%
Control, instrumentation, industrial electronics and computers	20%
Components (excluding imports going into production of indigenous equipment)	20%
Consumer electronics	25%

The strategy for development outlined earlier touches upon the need to stimulate production in the area of telecommunications, industrial and professional electronics and electronics for Defence and Aerospace. The production of the instruments of mass communication like radio and television sets also needs to be stimulated so that the policy with regard to the economic betterment of the people through use of the media can be effectively implemented; or else this policy could receive a setback for want of necessary hardware. The assembly of radio and television receivers is however dependent on availability of good quality components. With these, the assembly industry can flourish with low level of investment and give rise to substantial employment. Components ultimately are the life blood of the electronics industry and stimulating their production is the basis of the strategy for development already outlined. The one sector of electronics, which unfortunately gives it an elitist image is the consumer area because of the popular association of electronics, with fancy transistors, tape recorders, record players, electronic watches, TV games and the like. As happens in market controlled economies the world over, it is the consumer sector which provides the bread and butter to the electronics industry and thereby allows it to invest in the other sectors of electronics industry vital for economic development. However, till now 80% of the consumer electronics production in our country is accounted for by radio and television sets catering to the basic economic need for mass communication, so easily taken for granted and so readily overlooked, indicating that in reality our electronics industry is by no means elitist.

7.3 The committee recommends that the electronics industry (other than the consumer sub-sector) and more especially the electronics components industry should be regarded as a priority industry and this should get reflected in the relevant acts, rules, regulations and guidelines. The Committee also recommends that, based on its priority status, the benefits which are available to various priority industries under the various acts, rules and regulations should be extended also to the electronics industry (excluding the consumer goods area) and especially to the electronics components industry.

7.4 The rate of obsolescence in the electronics industry is very fast and the Committee understands that even leading Public Sector Undertakings in electronics write off their plant and machinery used for manufacture of components over a 5 year period and in some cases even over a 3 year period. Even though under the Income-tax Act, the rate of depreciation allowed is only 10%, in their commercial accounts 20% to 25% depreciation is provided for every year. In electronics, plant and machinery, being specific to the components and the technological process involved, get obsolescent alongwith the component in a five year time frame. An unrealistically low rate of depreciation out of step with the commercial rate adopted by the industry as a whole is a great disincentive to the technological modernisation of plant and machinery. The earlier recommendations of the Committee to remove some of the restrictions on licensing and to allow for liberalised import of raw material and components are contingent on the development of indigenous component industry to cater to the growth in the domestic demand for components at international prices. Therefore it is very necessary to give realistic depreciation rates to promote the indigenous components industry.

7.5 The Committee recommends that the depreciation rate for electronics components industry be fixed at 20% under the Income-tax Act.

7.6 The Income-tax Act provides for a partial 'tax holiday' on investments upto 31 st March, 1981 in new industrial undertakings, for a period of five years, in as much as only net profit in excess of 7.5% of the capital investment is subject to tax. In the latest Finance Act the tax holiday has been disallowed to consumer electronic industries included in the 11th schedule of the Income-tax Act.

7.7 The Committee recommends that the partial tax holiday incentive be continued for investments in new electronics components industries for the next five years since the components industry holds the key to development of electronics industry but has been a late starter in India. It is necessary to ensure that investments flow into electronics components industry and stability in fiscal incentives for at least five years is a necessary precondition for entrepreneurs to plan massive investments which may also involve foreign collaboration arrangements being worked out.

7.8 Guidelines/approach to be adopted have been indicated by the Government to the financial institutions for allocation of resources including lists of high priority industries. The following criteria for allocating resources to non-high priority industries after meeting the needs of priority industries have also been indicated:

- a) employment oriented and labour intensive projects;
- b) export oriented schemes normally with an obligation of 60 per cent and above;

- c) projects located in the backward districts;
- d) projects promoted by new entrepreneurs;
- c) projects based on indigenous technology; and
- f) other industries indicated in Appendix I of the Industrial Policy Statement of February 2, 1973.

Professional electronic equipment and electronic components industries have been accorded high priority, but consumer electronics come under non-high priority classification. However, most consumer electronic industries would satisfy the employment oriented and labour intensive criteria. The guidelines are clearly unexceptionable and the Committee was therefore a little surprised to hear complaints from some quarters in industry that they were finding it difficult to get adequate institutional finance or reasonable debt to equity ratio or credit against reasonably low margin money. The Committee is of the view that this difficulty appears to arise more out of inadequacy in preparation of project reports and deficiencies in their formulation. There might also be shortcomings in the appraisal machinery or procedure for nomination of outside appraisers.

7.9 The Committee recommends that the Department of Electronics should interact with the financial institutions and arrange for imparting training to entrepreneurs, who need it, in project formulation and help the financial institutions by supplying them panel of independent experts for project appraisal in the sophisticated field of electronics. Training courses could also be open to managers of banks and financial institutions. The Department of Electronics could utilise the facilities available in the Small Industries Training Centre of the Ministry of Industry for this purpose.

7.10 The Committee received strong representations for abolishing the Broadcast Receiver Licence (BRL) fees on radio sets, on the ground that it would give a boost to the stagnating radio receiver industry and promote sale in rural areas; since only replacement market is now provided by urban areas. The factual data in Appendix 7.1 were presented to the Committee. A large percentage of Broadcast Receiver Licences (BRL) are not renewed beyond the first year and the percentage of renewal after 3 years is less than fifty. The production of cheap sets far exceeds the production of higher priced sets in this country. Even though the annual revenue realised from BRL fees is about Rs. 27 crores at present, the revenue from cheap sets is only about Rs 3 crores. With technological advances, the portability of radio receiving sets has advanced very considerably today as compared to 1940 when operation of receiving stations in each well to do home was licensed and a fee levied. Also the size of the administrative problems involved in taking measures to combat piracy (non-payment of fee) is so stupendous that the wisdom of technically holding half the population of radio set owners as pirates requires serious consideration. The excise revenue from manufacturers of radio sets is only of the order of Rs 5 crores per annum mostly from the higher priced sets and from the organised sector. The excise revenue already ranges from 15 to 25% ad valorem on low priced sets (mostly from the organised sector) to 35 to 40% on high priced sets, the unorganised sector paying very little. Additional one time levy averaging respectively Rs 75 and Rs 25 on the higher priced and cheap sets, equal to the average life time revenue on the sets through BRL, could yield Rs 15 crores and Rs 5 crores of one time annual revenue, though it may fall short of the present annual revenue of Rs 27 crores from BRL.

fees. But clearly a graded one time levy equal to the average life time revenue will be equitable on all regions and sectors of the society, and will do away with a highly inefficient system of levy and collection.

7.11 The Committee is of the view that the basis for raising revenue year after year by relating it to possession of a radio set is fast getting out of date, taking into account the technological advances, size of radio sets, their portability, extent of piracy on use of unlicensed sets, and less than 50% efficiency in levy and collection of BRL fees even after 3 years of sale. The basis for raising revenue should in future be a one time levy on a graded ad valorem basis roughly equal to the present average life time revenue received through BRL on the sets, cheap sets of value upto Rs. 165 being exempted from even the one time levy. Since low priced sets upto certain values and of certain types manufactured in the unorganised sector are exempted from excise duty and it may not be possible to exempt low priced sets other than cheap sets from the one time levy, even if produced in the unorganised sector, the one time levy is best collected through the agency of Central Excise authorities with the assistance, if necessary, of State Directors of Industries and District Industries Centres. The balance of Akashvani's expenditure can continue to be met partly by revenue from commercials and partly by grants from general revenues as at present.



## CHAPTER 8

### EXPORTS

#### Potential

Global trade in electronics would reach a staggering figure of \$ 138 billion (Rs 110,000 crores) in 1980; it is still growing and growing fast. This is because the developed countries, comprising North America, the Continent of Europe and Japan, are concentrating more on the development and production of technologically sophisticated research-based products at home and are importing increasingly the rest of their requirements, mostly in consumer electronics but also in other areas, from developing countries with cheaper skills. The off-shore operations of the multinationals are spreading far and wide from Singapore, Taiwan, Korea and Sri Lanka in the East to Shanon and Mayaguez in the West in the continuous search for cheaper sub-contracted imports. This factor, among others, has aided the build-up in international traffic in electronics. Access to the developed markets for the electronic products of the developing countries have been easy, as there are no significant tariff or non-tariff barriers in this sector.

8.2 Indian exports of electronics, including those from the Santacruz Electronics Export Processing Zone, are a pitiful \$ 50 million a year (Rs 40 crores) vide Appendix 3.11. The Committee on Exports of Electronics headed by Prof M.G.K. Menon proposed an annual export target of Rs 220 crores by 1983. Electronics industry circles with whom our Committee had discussions consider the target to be modest and have suggested, in lieu, Rs 500 crores.

8.3 This is not merely an exercise in idle targetting; it can be realised by all means, considering our preponderate endowments in electronics. Firstly, we have an industrial infrastructure, unlike most other developing countries which have staked claims to ambitious export programmes in electronics; this should assist our electronics industry in obtaining, from already established capacities, many of its mechanical components like pressed and turned metal parts, compression and injection moulded plastic components and items of tolling like jigs, fixtures, tools and gauges. Secondly, the raw material base in silicon, aluminium, synthetic resins and chemicals is fairly large and could be developed rapidly through a process of refining and upgradation to meet the stringent electronic standards. Last but not least, the most precious of all resources in this industry, namely human resources in the form of technical skills and electronic engineers are in fair abundance in our country; so is managerial expertise. Another factor which is equally important is that both are relatively low-cost which make our exports, once they get into stride, competitive. It should also be recognised that this export drive need not wait till the raw material base is developed or viable component capacities are built up; it can be sustained initially on assembly operations where there is the largest value addition in this sector. The low transportation costs and small intake of energy in electronics are added advantages. A thrust in exports can also give a fillip to employment generation and small industry development, as spin-off benefits, apart from earning valuable foreign exchange for the country.

8.4 The major export markets are in USA, Canada, West Europe and Japan for the reasons already stated. This market segment is, however, characterised by increasing sophis-

tication and rapid technology change, declining prices, high domestic labour costs, increasing per capita demand and frequent changes in consumer tastes. It is little wonder that every developing country is keen to sell, particularly consumer electronics, to these mass markets; but those countries, not excluding India, which cannot keep abreast of technological changes or those which cannot act with speed and drive, have little chance of actually doing so.

8.5 Studies made by various agencies show that this country can make a strong bid in exports for consumer items like radio receivers of all types including FM long-wave radio receivers, car radios and radios with read-outs; tape recorders, cassette players and record players; T.V receivers; public address systems and amplifiers; teaching aids; electronic toys and home electronic appliances. To achieve this, design changes like those based on integrated circuits and thickfilm circuits would be necessary. Similarly, adequate production and testing facilities for items like precision tape decks, micro-motors, magnetic heads, microphones and the like would need to be created. Quality and technology would have to be upgraded all along the line. In the professional and industrial field, computer software, testing, measuring and analytical instruments and communication equipment, like radar and telephone exchange equipment, offer bright prospects for export. In this area, however, capacities will need to be augmented, as home demand is also rising. Limited exports of components like receiving valves, transistors, variable condensers, loudspeakers, ceramic capacitors, silver mica capacitors and printed circuit board could be organised; but the thrust in the component field would come only when the country reaches volume production to international standards so that the cost of production can be brought down.

8.6 It is obvious that for mounting an export drive of the magnitude indicated earlier, we need to look critically where we have gone wrong and what we need to do with the existing institutional framework, export facilities and incentives. Broadly, a large chunk of the export target has to come from the Santacruz Electronics Export Processing Zone, an institution specifically set up for export. If the Zone is brought up to its promised potential through suitable restructuring, setting up of two or three more zones of the type could be considered gradually. The rest of the target has to come from the sprawling network of hinterland units; this would call for suitable export outlets. Specific aspects pertaining to these are discussed in the succeeding paragraphs.

### **Santacruz Electronics Export Processing Zone**

8.7 The Zone was established by the Government of India Resolution of December, 1972 (Appendix 8.1), after a study team organised by the Trade Development Authority, in cooperation with the Department of Electronics, had visited several Export Processing Zones abroad and reported on the export prospects and feasibility of setting up similar Zones in India. The operations of the Zone were intended to be confined to only electronics and for hundred per cent exports. It was suggested that the net value added should in no case be below 20% and, if possible, even 30% but the average could be around 50%. The units to be set up in the Zone were given the following facilities/concessions:-

- (a) import of capital goods, raw materials, components, tooling etc on Open General Licence;
- (b) duty-free import of capital goods and equipment;

- (c) exemption from customs and countervailing duties on all raw material, components, tooling etc;
- (d) exemption from Central Excise duties on products manufactured in the Zone;
- (e) capital goods, raw materials, components, etc supplied to the Zone from the Domestic Traffic Area were to be treated as exports and made eligible to all concessions as applicable to exports from the country; and
- (f) a single point clearance of applications for industrial licensing, capital goods imports, MRTP, FERA etc by a specially constituted SEEPZ Board (see Appendix 8.2).

The Government also set up a SEEPZ Authority under the chairmanship of the Secretary, Ministry of Commerce, for reviewing the performance of the Zone from time to time and for giving policy directions (composition of the Authority in Appendix 8.3). The day-to-day administration of the Zone was entrusted to a Development Commissioner with the necessary complement of supporting staff and officers including an Assistant Collector of Customs.

8.8 The Zone became operational in 1973-74. It is located in a hundred acre plot of land in Santacruz, Bombay, leased from the Maharashtra Industrial Development Corporation and fenced off with a security system for entry and exit. It was originally designed for accommodating 86 factory units, comprising 32 standard and 54 self-built factory units. As of date, the entire space in the standard units has already been leased out; a second identical standard design factory building is under construction. Many open plots for self-built factories are still to be taken up. As of date, the capital outlay on the project is Rs 2.5 crores with a recurring maintenance cost per annum of Rs 6 lakhs and on administration Rs 20 lakhs. Services and other expenditure incurred by the Zonal Administration are recovered through a graded service charge of upto 1% of the f.o.b value of exports from the Zone.

8.9 Twenty six units are currently in production in the Zone; their exports in the year 1978-79 were valued at Rs. 6.25 crores, constituting 15% of the current annual exports of electronics goods from the entire country. The employment in the Zone is 1,800. The average value addition in exports from the Zone has been computed at 55%. Production lines include, among others, items employing contemporary technology; some examples of this are core memory stacks, flat tube construction ceramic capacitors, metal film resistors employing the latest technology of deposition of nickel/nickel chromium/aluminium film under high vacuum, wire-wound resistors with high power/size ratio and stability, computer video terminals, loudspeakers using welding technology, high reliability micro-diodes and modern X-Ray and electronic equipment.

8.10 It is, however, a sad commentary on the project that the high initial expectations—for example an annual export of Rs. 40 crores within three years of its establishment—with which the Zone was set up, have not been realised. The declining performance of the Zone is illustrated in Appendix 8.4. The Committee was informed that the waning response to the Zone was due, in the initial stages, to the rejection of applications from potential investors on the ground that the technology to be employed was either not contemporary or not of a high

level. The Committee spent some time in analysing the factors responsible for the totally inadequate performance of the Zone and in identifying what should be done to revitalise it.

8.11 The first obvious conclusion which the Committee reached was that the Export Zone cannot really take off unless it offers facilities which are at least on par with those offered by other similar zones in the neighbouring countries. This, therefore, is the basic premise on which the concept of a free trade zone has to be developed if it has to succeed. As against this, the most striking aspect of the current operations of the Zone is that gradually the interest of the Indian investors in the Zone has declined because the incentives available to the units in the Zone are not significantly better than what is available to the hinterland units; nor have the foreign investors found in the Zone a red-tape free climate as in free trade zones established in countries like Taiwan, Ireland, Korea, Singapore, Puertorico, Philippines, Panama and more recently Sri Lanka. A comparison of the facilities/concessions provided by the foreign Zones would show the far greater attractions and inducements which they offer, in relation to SEEPZ. A comparative statement is given in Appendix 8.5.

8.12 The very concept of Export Processing Zones or Free Trade Zones is a privileged customs treatment and red-tape free clearance on all matters pertaining to setting up of units, imports, production and exports. The present superstructure of SEEPZ—a Development Commissioner on the spot but without any significant authority to settle matters across the table, a Board functioning far away from the Zone to which applications for clearances under the industrial licensing, foreign collaboration, MRTP/FERA laws etc have to be put up by him and finally an Authority overlooking the Board as well as the Commissioner—militates against this concept. It must be realised that foreign investors who usually fly out their top personnel to such Zones around the world for very short periods to settle and finalise investment decisions are not likely to look with favour on this Zone in India which has to go through the motions of a rule ridden system; there are other nations who are only too willing to have them.

8.13 The Committee was informed that in almost all these similar zones in different countries the Zonal Administrator is the one and only authority who gives all the clearances on the spot. The first step which the Committee would recommend, therefore, is that the Development Commissioner, Export Processing Zone should be fully authorised to take and communicate decisions on all matters including Central customs/excise questions. The status of the Development Commissioner should be such as to enable him to effectively discharge these functions. Further, under the recommendations of the Committee in the earlier Chapters on Industrial Approvals, Imports and Tariffs etc. there will be very little advantage accruing to the present SEEPZ Board. Therefore, the Committee is of the view that the SEEPZ Board should be abolished and its duties and powers handed over to the Development Commissioner SEEPZ. The overall surveillance of the functioning of the Zone is already entrusted to the high powered governing body of the SEEPZ Authority, with only the initial approval of projects being given by the Projects Approval Board, which will henceforth be centralised in the Electronics Approval Board. Obviously, subject to suitable guidelines, powers to the maximum extent possible should be delegated by the governing body to the Development Commissioner. If this were done, the present irritating procedures even in small matters of day-to-day importance like disposal of scrap generated, repairs of machinery outside the Zone, moulds or materials to be sent out of the Zone for intermediate processing but to be brought



back again before final exports etc. would be obviated. It is relevant to mention here a classic case of delay for two years, because of such procedures, where a solution could not be found to a simple problem of assessment of duty on products sold by the Zonal units to hinterland units against the latter's valid actual user licences. All the time, the hinterland units have been importing merrily against their licences, goods from other foreign trade zones but not from our own. This is the extent to which we can become prisoners of our own procedures, rules and regulations.

8.14 Apart from restructuring the Zonal set-up in the manner indicated above, the Committee recommends the following substantive concessions as absolutely essential to revive the flagging morale in the Zone and for making it a success:—

#### **(a) Tax Holiday**

A reference to Appendix 8.5 would show that all foreign Zones offer exemptions from corporate tax/income tax for the units situated in the Zones for periods ranging from five years to 15 years; where the initial period of tax holiday is short, subsequent periods attract taxation at low or nominal levels. Having regard to the fact that SEEPZ units have little or no domestic market in the hinterland where profits are high, and also the fact that exports from the Zone do not qualify for cash compensatory support, it is necessary to match the incentives provided by the other foreign Zones, at least in some measure, to provide adequate inducements to potential investors. The Committee would accordingly recommend exemption from corporate tax and tax on dividends for SEEPZ units, existing and to be newly set up, for a period of five years with an inbuilt provision to review the question of 'tax holiday' for a further period on the merits of each case at the end of the five years.

#### **(b) Accelerated Depreciation**

In the light of the fast rate of obsolescence in electronics, in the Chapter on Fiscal Measures, the Committee has recommended a higher depreciation allowance for the electronic units in the components sector. As SEEPZ units are tuned to 100% export, the need for their modernisation to maintain the competitive edge in international markets would be far greater than that of hinterland units. A study of the practice in foreign Zones shows that it is usual for operating units in the Zones to generally write off the capital equipment value in two years. Accordingly, the Committee would recommend a higher rate of depreciation for Zonal units which should at least be 30% every year.

#### **(c) Service Charge**

The service charge levied by SEEPZ Administration at 1% of the f.o.b. value of exports really amounts to 5% of the value added where the import content is 80%. Often, this amounts to practically the whole profit on the unit's operation and has, therefore, been resented by SEEPZ units. It would also more than off-set in many cases the concession given by way of duty waiver on capital goods. No such service charge is levied by either Kandla Free Trade Zone or most other foreign Zones according to the present information available with us. The Committee would, therefore, recommend its abolition.

#### **(d) Exemption from levies other than Central Customs/Excise Duties**

Because of the federal structure of our country, the SEEPZ units, unlike units in other foreign Zones, have to incur a multiplicity of taxes, other than Central Excise/Customs duty, by way of Central Sales Tax, State Sales Tax, Octroi, Electricity Duty, etc. As it would be administratively difficult to arrange for exemption from such taxes levied by numerous State Governments and local bodies in addition to the Central Government, the Committee would recommend that an ad hoc but appropriate percentage of export value to be allowed as compensation towards such levies, be worked out by the Development Commissioner in the case of each unit and allowed under the Market Development Fund which is, in fact, meant to remove such disincentives to export.

8.15 It is necessary to reiterate that on other issues like export credits/finance, market development grants for export promotion travels, sales and publicity etc the Zonal units should at least be treated on par with exporting units in the hinterland. Also, in procurement of supplies of cement, steel and other building materials and in obtaining telephone, telex and other rudimentary means of modern communication, the Zonal units should be totally insulated from the vagaries obtaining in the hinterland, as otherwise, all the other concessions given to them would be set at naught with protracted delays in the completion of projects. Delays add up very significantly to the costs of the projects.

8.16 The Committee feels that if these recommendations are accepted and enforced, the climate for hundred per cent export oriented investments in the Zone would improve enormously, making it possible for it to achieve an annual export of Rs. 100 crores within a short span of time. If on review after two years, the Zone's operations are adjudged to be successful, a time would have arrived for opening of two or three more Zones of this type in the country.

#### **Joint Ventures**

8.17 In recent years, because of the emergence of substantial capabilities in the country in engineering and systems design, in consultancy services and equipment fabrication and in undertaking turnkey projects, Indian entrepreneurs have gone abroad and established joint ventures in developing countries. Over hundred such joint ventures are already in operation in South-East Asia, West Asia and Africa in fields like textiles, sugar, paper, vegetable oil extraction and refining, a variety of chemicals and engineering products. Many more are in the phase of execution. The Committee's assessment is that there would also be several opportunities for promoting joint ventures in the developing countries in electronics with or without cooperation from third countries in the developed world. The infrastructure which the country possesses in this direction by way of a plentiful supply of qualified and trained electronics engineering and technical skills, and the many consultancy organisations in electronics, both in the public and private sectors, operating in the country would stand us in good stead in this direction. While broad policy guidelines have been laid down by the Government in regard to such joint ventures abroad, these would require to be turned to the electronics situation which, as already stated, differs from many other areas of production activity in terms of gestation, technological obsolescence etc. The Committee would recommend that proposals for such joint ventures abroad from Indian entrepreneurs in the field of electronics be henceforth received and cleared by the Electronics Approval Board, the establishment of which has been recommended by the Committee. In proposing this transfer of responsibility to the Board, the

Committee is guided by the paramount need to have an integrated organisational approach to the growth of the electronics industry which differs from other industries in many respects.

### **Exports from Hinterland Units**

8.18 Although SEEPZ and other similar zones to be established in future would contribute sizeably to the export target, a significant share in export will continue to come from hinterland units. In terms of the current policy, although some incentives and facilities like import replenishments of components and raw materials against exports of end-products, cash compensatory support for export of a few products, duty-drawback rates for again a few products, packing credit etc. are available, the coverage, quantum and procedures governing their grant have not met the requirements of a stable and expanding export drive in electronics. This becomes relevant in the context of the climate for substantial additional capacities which, the Committee feels, would be generated as a result of its earlier recommendations and for which organised export outlets would have to be found. At one stage the view held was that such exports should be enforced through imposition of export obligation but, fortunately, this approach has recently been given up. The Committee is entirely in agreement with this.

8.19 The Committee considers, on the other hand, that a system of reasonable incentives, simple to operate with not too many channels of processing, would be a much surer way of promoting exports of electronics. Towards this end, the Committee would make the following recommendations:-

#### **(a) Cash Compensatory Support**

Hinterland units, unlike SEEPZ units, have to reckon with the import control regime in having to procure from indigenous sources at least some high cost components/materials; also the incidence of the multi-point indirect taxes and levies which the former incur in the manufacturing process from material to product is not totally refunded under the drawback system. It will be seen that the existing rate of 12½% cash support, designed to compensate, in principle, the hinterland units for the purpose, does not in fact do justice to the actual duty incidence, vide Appendix 8.6. The Committee considers that a rate of 20% would be more appropriate, especially as, in its view, the question of cash support to electronics exports should not be regarded merely as an exercise in bridging f.o.b costs and f.o.b recoveries but more as a productive employment subsidy and incentive to break into fiercely competitive markets. It would also recommend that the rate should not be reduced for at least three years.

#### **(b) Drawback of Duties**

At preset, all-industry duty drawback rates are available for only three electronic products. As the field of electronics in the consumer, professional and industrial areas covers a very vast complex of diversified systems, sub-systems, equipment, sub-assemblies and components to rapidly changing designs, it does not appear to be feasible to conduct a meticulous and frequent examination of the duty incidence in each case. The Committee would, therefore, recommend that drawback rates be empirically fixed on the basis of a percentage to be applied to the f.o.b value of exports, if necessary, in three or four distinct

groups of related equipment and components taking into account the likely incidence of Customs and Central excise duties entering into the products covered by each group.

### **(c) Duty Exemption Scheme**

The present duty exemption scheme for exports which has not got off the ground needs to be reviewed, its procedures simplified and the scheme made to cover all raw materials, components, ancillaries, accessories, tooling etc required to be imported for production of electronic equipment for export. The import policy for 1979-80 which has made an attempt at streamlining, still prescribes numerous paper approvals and physical checks. The Committee considers that a simple application from the exporting units of what they require by way of duty-free import, supported by a chartered agency's certificate, should be adequate for granting the duty exemption; in case of misuse or non-performance, penal duties may be levied. Also the facility should be extended to programmed but committed exports, without insistence on firm orders, subject of course, to the usual bonds/bank guarantees.

### **(d) Import Replenishment**

The present scheme of Registered Exporters Policy lays down import replenishment rates against exports to cover imports of banned/canalised items. Since as per the recommendations made earlier, banned items would be a few and no canalised items at all, a view might be held that there would be no need for such rates. The Committee feels that replenishment rates would still be necessary and these would also need to be rationalised to facilitate import of new generations of components, designs and prototypes for product development, special toolings and drawings. Adequate flexibility should also be given to the exporting units in their shopping list taking into account the fact that there are rapid changes in the circuitry designs. The Department of Electronics should work out the appropriate rates for CCI & E to implement.

### **(e) Market Development**

An important aspect of export promotion in electronics is the need, as already stated, for a continual presence of exporting units in foreign markets in terms of publicity and public relations, attractively brought out technical brochures, frequent visits of technical and commercial representatives and bonded warehousing arrangements. For this purpose, the Committee would recommend liberal grants from the Market Development Fund not only to approved organisations and eligible merchandising Export Houses but also to individual units with an export performance and potential of over Rs. 10 lakhs and Rs. 1 crore per annum respectively; it is needless to say that such grants should also be supported by the requisite foreign exchange component, including blanket foreign exchange for export promotion travels abroad.

### **(f) Packing Credit**

Under the guidelines to financial institutions and banks, advances under concessional rate of interest are given as pre-shipment credit (packing credit) upto 180 days at 11.5% per annum and for a further period upto 90 days at 13.5% per annum, where necessary, to various industries. Presently only the following electronics industries qualify for the credit to the above extent.

- (i) power line carrier communication equipment,
- (ii) telecommunication equipment including telephone and telegraph exchanges (excluding television and radio receivers).

The other electronic items qualify only for packing credit for 90 days at 11.5% and for 45 days thereafter at 13.5%.

The packing credit is necessary to finance export orders in the interregnum from the opening of a firm letter of credit in favour of the Indian exporter by the foreign party and upto the date of shipment. Some time is also taken for importing components required for the export effort and the fiercely competitive international market for exports in electronics allows of little margin for the exporter to borrow his finances at the normal interest rates. Many of the professional grade electronics equipment, control systems etc. which require funds being locked up in capital, inventory etc. over long periods are no different from the communication and telecommunication equipment in the matter of financing. The Committee recommends that electronics export items, other than those which require mere assembly activity with indigenously available components, should also be eligible for the more liberal packing credit terms.

### **Quality in Electronics Exports**

8.20 It is necessary to stress the importance of standardisation and quality control in an area like electronics exports where there is stiff competition not only from the developed but also the developing countries. A Committee headed by Brig B. J. Shahaney, Secretary (Technical Development) had made a series of recommendations on organising adequate quality control measures for exports, including a scheme of self-certification by units with an unblemished record of quality performance both at home and abroad. This Committee is of the view that the recommendations of the Shahaney Committee should be implemented as early as possible. The Committee would also like to stress the need for test facilities available in the field of electronics in the country being pooled and coordinated for effective quality assurance services to the exporting units as well as to their foreign customers. In electronics, different countries follow different types of standards and buyers from these countries would normally specify the standards operative in their respective countries. The Committee would suggest that export promotion organisations in the field should assist exporting units by making available to the latter at little or no cost, codified reprints of standards, including English translations, on request.

### **Institutional framework**

8.21 At present there is a multiplicity of organisations dealing with electronic exports like the Engineering Export Promotion Council, Trade Development Authority, Electronics Trade and Technology Development Corporation and the Institute of Foreign Trade, leading to considerable diffusion of effort and overlapping. Although each of these organisations, which are supported by considerable Government grants, has some experience and expertise, the Committee considers that for a concentrated export drive in electronics, which offers tremendous scope, there should be a distinct and separate Export Promotion Council consisting inter alia of representatives of the Ministry of Commerce and the Department of



## CHAPTER 9

### ROLE OF THE SMALL SCALE SECTOR IN ELECTRONICS

In the country today, there are about 120 units in electronics in the organised sector, against over 1000 units in the small scale sector. In certain segments of the electronics industry, specially, those involving assembly operations and those which are highly labour intensive, there is considerable potential for development in the small scale sector, because of the very high turnover to investment ratio. Even with an investment of less than Rs 10 lakhs in plant and machinery, small scale units can reach, in some cases, turnovers exceeding Rs 1 crore per year, as, for example, in assembly of consumer equipment where indeed they have made rapid progress.

9.2 In the area of control, instrumentation and industrial electronics, accounting for about 15% of the share of total electronics production, the share of the small scale ranges from about 50% in testing and measuring instruments to about 10% in industrial electronics including power electronics. Small scale units are also manufacturing some items of medical electronic equipment, process control instruments and analytical and other instruments.

9.3 In the area of consumer electronics, which accounts for about 25% of the total production of electronics in the country, the share of the small scale sector is about 60%. At present, it accounts for 75% of the TV sets marketed in the country and about 60% of the calculators produced. Many of the items which go into the production of consumer equipment are accounted for by the output of the units in the organised sector and by imports, but even then the share of the small scale sector in the final production of some of the major consumer electronics items is significant (Appendix 9.1).

9.4 In electronic equipment for mass communication, telecommunication, aerospace and defence and computers, which account for about 40% of the total electronics production in the country, understandably there is hardly any small scale unit. The areas of programmed calculators and microprocessor based systems are exceptions, in which only a few small scale units have so far come up. This is an area which offers considerable scope for the development of the small scale sector and needs to be exploited. In the area of components, accounting for about 20% of the national production of electronics, about 25% of the production comes from the small scale sector. Manufacture of process oriented components is capital intensive and requires considerable investment in R&D to keep the technology contemporary. Even here, the small scale units have a role to play in the fabrication and assembly of some items/components; in fact some small scale units are already engaged in this type of work.

9.5 The national policy of developing the small, tiny and cottage sectors finds ready application in electronics, in various assembly operations and the easy manner in which the industrial operations can be decentralised and farmed out to the small scale and the tiny sectors and to ancillaries. In the components manufacture area, even if competition from the organised units should increase because of delicensing investments upto Rs 10 crores, additional production of components would give rise to additional investment and employment generation in assembly type operations by the small scale units. Consumer electronics, assembly of test and measuring instruments and simple control and micro-computer systems are some of the areas suited to the small scale sector; in these areas, therefore, the policy of

the Government would need to be implemented through reservation of assembly activities for small scale sector and through ancillarisation. In addition to reserving production of some items for the small scale sector and the benefit of fiscal concessions being given only to this sector, some assembly activities should also be exclusively earmarked for this sector. There could be a genuine apprehension that in view of the partial delicensing, which has been recommended to facilitate additional investment by units in the organised sector, the small scale sector may suffer. To guard against this, it is recommended that any further expansion of capacity in the area of consumer electronics in the organised sector should be subject to the stipulation that assembly operations would be confined to the small scale and ancillary units only. Illustrative lists of such items and activities to be reserved for the small scale sector are given in Annexures 5A & 5B to Chapter 5. Furthermore, the licensing mechanism applicable to investments in excess of Rs 10 crores and MRTP and FERA companies can be effectively used by the Government to encourage units in the organised sector to promote the small scale and ancillary units, through a progressive quantitative increase in their turnover coming from such units. In this context, the Committee is happy to note the legislation on the anvil for promotion of the small scale sector through a series of statutory measures.

9.6 The Committee is of the view that the existing policy for the promotion of small scale and tiny units is well conceived. For effective implementation, however, it requires more dynamic measures and not merely static reservation of products for small scale sector or denial of opportunities for growth to the organised sector. The real growth of the small scale and tiny sectors of industry has to complement the growth of the organised sector utilising contemporary technology, with mutual concern for each other's interest. The organised sector must be made to accept the responsibility for providing essential inputs to the small scale units and ancillaries in matters of technology, marketing, after sales follow up and making available raw materials and components; the State Electronics Development Corporations must also be made to play a much more effective role in this direction.

9.7 In the short run the manufacture of electronic products for various types of applications will develop very fast in the small scale sector. Accordingly a deliberate policy of liberal imports, efforts at extension of technology, imparting of training and encouragement to professionally managed centres providing common facilities for the benefit of units in that sector is recommended.



## CHAPTER 10

### RESEARCH DEVELOPMENT AND MANPOWER

The phenomenal advance made in electronics technology in the past three decades has been due to large scale concerted efforts in Research & Development both in the industry and academic environs. Electronics itself draws upon the progress in technology in a variety of fields and owes its own elevation to its being able to embrace skills, knowledge and achievements, through R&D efforts, in other related disciplines. In the field of electronics, from time to time, there has been a quantum jump in technology, completely revolutionising products and processes. Some of the well known instances of such quantum jumps are:-

- (a) Vacuum tubes to transistors
- (b) Transistors to integrated circuits
- (c) Integrated circuits to MSI, LSI and VLSI, and
- (d) Computers to mini-computers and micro-computers using micro-processors.

Such developments have been followed immediately by newer products in other industries accompanied by a very significant increase in the market potential for such products and the connected systems and applications. It must also be recognised that electronics has the unique feature in that, whereas on the one hand ingenuity of applying even available devices can result in a novel product, on the other, progress in materials, chemical and process technology can result in devices of newer and much higher order of performance. While the former requires comparatively a much lower order of investment, the latter calls for investments of a very high order in R&D.

10.2 With the impetus which was imparted to R&D in electronics as a result of the strong emphasis which the Bhabha Committee placed on it, a distinct sensitivity to the need for R&D in electronics in India has been created. While industry has taken up R&D activity only to a limited extent, the pursuits of our research and academic institutions have been wider leading to some noteworthy achievements in spite of resource and other constraints. Several agencies including the Department of Electronics have in the past attempted to identify technological gaps in relation to the felt needs of the country. Programmes have also been sponsored by the Department of Electronics for the development of technical competence; similarly the Department has financed R&D activities related to the design and development of products and techniques in the public sector. Some efforts to achieve complementarity in indigenous Research and Development programmes and import of technology have also been made. While these efforts are commendable, there is no doubt that the support for the R&D activity need to be geared up and oriented, in an appropriate manner, to achieve higher productivity and self-reliance and to elevate the quality of manpower.

10.3 It is estimated that over Rs. 20 crores have been released for R&D, by the Department of Electronics since it was set up in 1971 (Appendices 10.1 & 10.2) to various organisations and institutions in the country. Nearly half of it has been provided for promoting development of computer systems and applications and about a sixth each towards the

development of materials and components on the one hand and radars and navigational aids on the other. The remaining funds have been released for R&D in the other areas, such as control systems, industrial applications, consumer electronics, instruments, communication, broadcasting systems etc. Funding for R&D has been mainly determined by considerations of import substitution and self-reliance in strategic areas; in other areas, the main consideration has been the need to build up competence necessary to keep abreast of contemporary technology. Notable areas of R&D activities so far include development of an indigenous computerised system for air defence, defence radio network system, development of software for the computers produced in the public sector and development of some computer peripherals. Setting up of national facilities for micro-circuits and mask design is also significant.

10.4 Research & Development in industry has been, by and large, on an imitative basis. Some of the products developed indigenously have tended to be more expensive copies of equipment available abroad. The protection afforded to the products of indigenous industry has mostly encouraged such R & D rather than competitive and innovative R & D. Consequently, such industrial products progressively become outdated in quality and performance while continuing to remain high priced; this is so because the market mechanism has not been allowed to operate in forcing the manufacturer to invest in continued R & D to keep his products contemporary in relation to the international markets both in price and performance. Time has now come when the indigenous electronics industry must become more dynamic and take immediate steps to establish capability necessary for technology absorption, innovation and derivative development. This vital requirement must be built into all the major production organisations for the accelerated growth of the electronics industry with full recognition of the fact that in this industry the gestation period for development and production of any new product or system has to be necessarily short with rapid transfer of technical knowhow from design and development stage to production. Delays could force abandonment of the design and development efforts in certain areas because of improvements in technology elsewhere. This transfer of knowhow will be quick when the production units have inhouse R & D capability and engineer the fruits of their own R & D. If the R & D is outside the production unit, very close association between the R & D unit and the production unit will have to be maintained through effective coordination to achieve the desired results.

10.5 The Committee would recommend that the industries in the private sector, especially those in the organised sector, be persuaded to develop inhouse R & D capability which should not merely be for the purpose of obtaining fiscal reliefs but essentially for the development of indigenous technology and for adaptation and updating of the imported technology. While the Committee would not, for the present, recommend any legal measures for securing such an effort on the part of industries in the organised sector, it would urge that within the proposed framework of industrial licensing of MRTP and FERA companies and new units with an investment of more than Rs. 10 crores, and taking into account the present policy on the import of technology and foreign collaboration, measures should be taken to ensure that a reasonable percentage of the turnover or profits of the industrial units is expended by them on R & D which is meaningful, relevant and commercially linked with their production. In other words what is really required is that our Research & Development efforts must be related to the requirements of our industrial production along with a high

degree of cost consciousness. Linkage of any R & D effort with an industrial matrix must, therefore, be planned at the initial stages of a R & D project.

10.6 It must also be recognised that development of technology in our country in the areas of materials, components and devices is in a very nascent stage; as against this, the Committee has already underscored the importance and relevance of electronic components and devices as the critical elements in the growth of the electronics industry. It, therefore, recommends that a concerted effort in R & D in the area of materials and components technology should be organised by the Department of Electronics. The same may be said of industrial electronics and control systems incorporating computers, digital techniques and instrumentation. In this effort no resource constraint, financial, material or manpower, should be allowed to come in the way.

10.7 The Committee also recommends that the Department of Electronics should continue to fund institutions like the Universities and the Institutes of Technology on well identified projects including long ranging research programmes. This, the Committee believes, would help to elevate the quality of manpower development in our academic institutions apart from other benefits which are bound to accrue as a result. Similarly, in the view of the Committee, the existing national research organisations in the area of electronics should be given all the support so that they continue to grow, preferably in identified areas of specialisation so that there is no duplication of effort with consequent dilution of our scarce resources.

10.8 Taking all the above factors into account and recognising that a lot of leeway has to be made up in the field of R & D in electronics, the Committee is of the view that the Department of Electronics should be entrusted with the responsibility for giving a sense of purposeful direction to and for the coordination of all R & D activities in the country. This should be ensured not merely through the mechanism of funding projects in various institutions but through promoting bilateral organisational linkage between industry and the R & D institutions. To achieve all this, the Committee recommends that an Electronics Research & Development Organisation (ERDO) under the Department of Electronics should be set up. The structure and the specific functions of this organisation including a proposal for setting up an Electronics Research & Development Board to guide and direct its operations have been dealt with by the Committee in the Chapter on 'Organisational Structure'.

10.9 In 1966, the Bhabha Committee had stressed the need for a national effort for development of technical manpower for meeting the requirements of the electronics industry. It is estimated that the annual outturn of our engineering institutions offering degree courses in electronics or in allied disciplines with specialisation in electronics is of the order of 2,500. A small but significant proportion of this outturn gets lost due to migration or diversion into other professions. To achieve the levels set for the development and growth of the electronics industry, which in turn would require essential Research and Development inputs, it is necessary that much greater attention is given to ensure that our potential engineers and technicians fresh from the universities and institutes, measure up in quality to the high standards, with the right orientation, required by the electronics industry. This would require development of a suitable strategy and coordinated action between the Department of Electronics, Ministry of Education and the Ministry of Labour. In this we should not lose sight of the requirements of the electronics industry for highly skilled workmen, technicians, and the supervisory

personnel. The Department of Electronics should also work out a scheme for the exchange of technical personnel at all levels between the industry and the educational and R & D establishments so that they are aware of each others' specific requirements thereby helping to establish linkages between the two besides providing an avenue for cross-fertilisation of ideas.



## CHAPTER 11

### QUALITY MANAGEMENT AND STANDARDISATION

One of the major constraints to the growth of the Indian electronics industry is the absence of an adequate level of consciousness of the importance of maintenance of standards through testing and quality control, in the industry as a whole. These are essential prerequisites for the growth and development of any industry from a long term point of view and, more so, in the case of electronics industry. Investment by the industry, especially in the unorganised sector, in testing and quality control, has been inadequate and, barring a few rare exceptions, there has been hardly any attempt at developing long term markets on the strength of quality. In the anxiety to become competitive in price, often the quality of the product is compromised, this indeed is a very shortsighted policy for any industry which aims at long term growth and expansion. Only the public sector units and some large units in the private sector are reasonably well-equipped to maintain adequate standards adopting modern methods of quality management and producing strictly to accepted national or international specifications; but there seems to be no consensus at a systematic planned attempt to achieve this for the industry as a whole. Similarly, regular updating of existing ISI and other specifications so that ultimately they conform to international standards which are fast improving and changing, has not been so far systematised; the reason for this is that procedures of certification to standard specifications and quality assurance systems have not been institutionalised at a national level. Moreover, in some cases irresponsible attitudes continue to prevail. Even where preproduction samples have been approved and tested by competent agencies, it is sometimes found that the production line turns out substandard pieces. Such attitudes must be firmly corrected.

11.2 The Electronics Commission had taken a decision in 1972 that the State Governments should be assisted in the setting up of Electronic Test and Development Centres (ETDC); for this, a sum of Rs 25 lakhs was earmarked for each centre towards the procurement of equipment. A list of centres most of which have come up in the last two to three years is given in Appendix 11.1. These centres have so far not been equipped for testing professional grade items nor with facilities for environmental testing to standard specifications. Activities like calibration of test equipment used by the industry and rendering of technical help to entrepreneurs through maintaining data banks and a library of accepted specifications, reference books and journals are still to be started. Moreover the centres have tended to grow in isolation without establishing firm linkages with the industrial units around them or those spread over the State; they are still to be manned by adequate number of technically qualified staff. Further these centres have not yet come up to a level to merit recognition by ISI. They have also to go a long way before they can take on all the inspection, certification and quality assurance work relating to export consignments from their area. Similarly, it has not been possible so far to institutionalise full integration of the four regional standardisation centres set up/planned to be set up by the Department of Electronics at Delhi, Bombay, Bangalore and Calcutta under the national standardisation, testing and quality control programme with the industry.

11.3 The Committee is convinced that the area of standards and quality assurance is very important and should engage the serious attention of Government and industry with a view to setting up institutionalised arrangements covering all production units in electro-

tics. The Committee recommends that the working of the Test and Development Centres and the four regional centres should be entirely reoriented to the requirements of the industry which should have a considerable say in their planning and management. This should be ensured by the Department of Electronics through the setting up of a suitable standing forum. The Committee also recommends that the ISI and the test centres including the export inspection agencies should coordinate their efforts under the aegis of the Department of Electronics with those of the Electronics Standardisation Sub-Committee of the Ministry of Defence (LSSC) so as to ensure continuous refinement of specifications and procedures for testing, certifying and quality management. The JSS standards are generally adopted to fill the gaps in the national standards in respect of professional grade components. It may also be relevant to point out that the general consensus appeared to be that there was greater acceptance all round of JSS specifications especially for the professional grade items. It is felt that a greater attempt should be made to coalesce the ISI and JSS standards into national standards to the extent possible. The Committee further recommends that immediate arrangements be introduced for inhouse quality management by major manufacturing units. Apart from Government test centres, inhouse inspection facilities in some of the major manufacturing units may also be recognised for the purpose of their issuing certificates of quality and conformity to specifications in respect of the products of the other units also. Furthermore, surveillance by authorities and agencies nominated by the Department of Electronics, of the working of such recognised centres in the public and private sectors would also be necessary. The ultimate aim should be to link every manufacturer in the country with a recognised quality assurance centre. For the implementation of the above recommendations, it is suggested that a plan be drawn up and given effect to by the Department of Electronics in close collaboration with the LSSC, ISI and leaders of the industry in the public and the private sectors.

11.4 At present a rebate of 1/2% on interest on loans from financial institutions is understood to be available to small scale manufacturers whose products bear the ISI mark. The Committee recommends that to facilitate the promotion of quality consciousness, 1% rebate on loans from financial institutions should be available to all units whose products are inspected and certified by agencies nominated or recognised by the Department of Electronics. The Committee also recommends that all nationally financed test and inspection centres should make available their facilities free for an initial period of 3 to 5 years purely as a promotional activity with a view to popularise the inspection and certifying procedures among the units manufacturing electronic products.

11.5 Standardisation of specifications in the sense of rationalisation and variety reduction is also an extremely necessary feature in the development of any industry but care has to be taken that this does not stifle design and development of new products, especially in an area like electronics where technology is fast obsolescing. Therefore a judicious balance has to be struck between 'standardisation' and the need for innovation of new designs and products. Furthermore, the fact that we are importing about 80% of our professional grade components and about 40% of other types of components also indicates that such standardisation efforts in the country will have to be resilient to the need for imports and the increase in variety of specifications which it implies. Drawing up and enforcement of national specifications therefore would have to be progressed gradually as a long term measure with maximum agreement from the industry, and users.

11.6 The Committee recommends that the Department of Electronics should organise meets with industry annually, if not at more frequent intervals, to ensure that the national specifications get evolved over a broad spectrum commensurate with the requirements of the industry and without standardisation becoming a dogma. There is a great deal of work which is still required to be done in the area of standards, testing and quality assurance and the Committee is of the view that the Department of Electronics should provide the necessary thrust and leadership in this vital area.



## CHAPTER 12

### COMPUTERS

Electronic Computers and Data Processing Systems have brought about a near revolution in the entire gamut of organised human activity. The use of microprocessor based systems and minicomputers as a part of the industrial control technology has also now been well established in the developed countries as a means towards increased productivity, better quality control and lower rejections, resulting in lower costs of production and higher profitability. The impact has also been felt in the Indian scene with the result that there is growing demand for large, medium and small computers in diverse cross sections of the economy, the important user groups being industrial and commercial undertakings, research and development establishments, software export houses, training and educational institutions and consultancy organisations.

12.2 Introduction of computers does not necessarily lead to unemployment as is often believed; on the other hand it creates new avenues of employment qualitatively of different nature. What could happen is that a few persons may be displaced from their original position and the additional employment created may not necessarily be in the same affected organisation or division. It is pertinent to mention here that the report of the Committee on Automation as well as the study made by the Bureau of Public Enterprises did not reveal retrenchment or reduction in labour strength in the enterprises which had installed computers. Besides, the gradual indigenisation of the computer industry together with its accessories, peripherals and software is bound to generate new employment as also to help improve the quality of employment.

12.3 Moreover, as the Public Accounts Committee had observed in their 221st report (April 1976) the computer is not to be viewed 'just as a labour-saving device but as an instrument, indispensable in the modern context, of upgrading organisational capability to take well-informed and vitally productive decisions after taking into consideration the present day multiplicity of relevant factors'. Though the use of computers in the country as an aid to decision making is still at a very rudimentary stage, the potential for such usage at different levels of decision making is indeed very high.

12.4 The main features to be taken note of in our country in the computer field today are:

- (a) a nascent indigenous industry on the threshold of producing minicomputers and microprocessor based systems to modern designs which cover a wide spectrum both of prices and computing parameters;
- (b) the need for rationalisation of the tariff structure to enable the computer industry to take off;
- (c) the need for the indigenous public sector industry to switch over to modern designs and systems with a view to becoming competitive and viable;
- (d) the national problem of maintaining in trim an increasing number of diverse models of imported systems and the basic infirmities of the Computer Maintenance Corporation set up by the Government to deal with it on a commercial basis;



- (e) the policy and procedures for import of computer systems which would admit of streamlining; and
- (f) the need for organisational coordination between the national and regional centres created for the promotion and optimum utilisation of computers in the country.

The Committee has considered it necessary to address itself to these specific areas of policy and organisational structure in the field of computers.

12.5 It is indeed unfortunate that, despite the recommendations of the Bhabha Committee in 1966 that we should develop a viable indigenous computer technology, our industry has lagged behind and we have not been able to develop indigenous technology which could be considered contemporary. Over the last 7 or 8 years about 200 small sized computers and systems for dedicated application have been allowed to be imported; this shows that there has been significant advance in our country in the user outlook towards computers, but as explained earlier it is unfortunate that our indigenous computer industry has not kept pace with the advances in the user area. It is, therefore, the view of the Committee that immediate measures are necessary to ensure that the indigenous production of contemporary computers and peripherals makes rapid strides so that the range of computer systems produced in the country does not continue to be restricted. The Public Accounts Committee (221st report, April 1976) had also stressed the need for intensive efforts to step up production of indigenous computer systems.

12.6 With the coming of the integrated circuits and in particular of medium and large scale integrated circuits (LSI), the design and application of computers has attained new dimensions. In fact, the debut of the large scale integrated circuits and the steep fall in their prices both have given a fillip to the fabrication of microprocessor based systems and modular designs capable of integration upto medium sized computer systems. Minicomputers come in between the single chip microprocessor and the medium to large computer system. Definitions here rapidly change and 'minicomputers' are artificial classifications with their boundaries constantly changing. The dynamic nature of computer business, where the cost of peripherals and software dominates business considerations, now offers powerful processors at relatively low prices for diverse applications in industry. Use of systems through ingenuity in software can help to cut down hardware costs. In this area, flexibility and open endedness are the key words and technology cannot be rigidly defined. Decisions therefore on what to import, what to produce, how to design and fabricate must be left to manufacturers so long as CKD and SKD kits are not imported.

12.7 Programmes or the software to utilise the computer for any application have to be designed around the architecture and design features as well as the application needs. It is in the area of computer software development to suit specific applications that there is tremendous scope for originality and innovation. The Committee is of the view that the country can mobilise the talent to design its own computer systems and progressively come up to contemporary levels in the world in the field of systems development and systems engineering, provided measures are taken to ensure adequate availability of indigenous and imported components at reasonable prices. All sections of the computer community are agreed on this.

12.8 Development of systems and systems engineering can be taken up by small technically qualified groups; however this will require intensive marketing efforts and high level of support systems, after sales service and training and education of the customer. Such levels of organisational efforts and marketing may not be possible for small scale sector units and such technically qualified and creative groups may need to enter into suitable commercial arrangements as ancillaries or suppliers of original equipments and software to those with marketing and after sales service facilities. Presently, there are six established indigenous manufacturers who are marketing commercial minicomputer systems capable of undertaking data processing, inventory control and general purpose work. One of them proposes to market a system for business and scientific data processing also. Another is planning to market a system designed to meet the needs of users in data processing, data preparation and data communication. These systems will be typically useful for small business applications and for companies with annual turnover of upto about Rs 3 crores and employing a few hundred persons. Such systems can also be used for localised data processing by large organisations.

12.9 The Committee is of the view that the existing organisations and others who are likely to enter the area of minicomputers and microprocessor based systems, for manufacture and sale within the country and those who have gone in for medium sized computers have the capability to satisfy a good proportion of the functional requirements of users within the country. In the next 2 to 3 years they can supply small and, to some extent, medium computer systems which at today's costs may not exceed Rs 50 lakhs. Their manufacture would involve import of sub-assemblies in the initial stages but progressively they will have to undertake their manufacture from the stage of assembly of basic electronic components rather than sub-assemblies. The same would also be true of indigenous manufacture of peripherals where the requirements are economically viable; peripherals required in small quantities may have to be imported for some years to come. It should also be possible that after 4 or 5 years the indigenous capability may well extend to supply of Computer Systems even beyond the range of Rs 50 lakhs. The Committee, therefore, considers that the basic rationale of policy measures proposed earlier, subject to certain modifications which are explained later in this Chapter, in respect of industrial approvals including foreign collaboration, import policies, tariff structure, exports, fiscal incentives etc apply equally to the area of computers including minicomputers and microprocessor based systems, peripherals as well as other related items of equipment and software. These policy measures would impart the necessary dynamism for the rapid development of this sector of the electronics industry where the growth has been somewhat stunted so far and where a very large technological gap exists and needs to be bridged.

12.10 Briefly, therefore, any strategy for the development of the computer industry in the present situation has clearly to give first priority to the minicomputers and microprocessor based systems costing not more than Rs 50 lakhs with maximum flexibility in the import of components. Here the talent exists but needs only to be mobilised. Second priority has to be for medium computers costing more than Rs 50 lakhs. Here the public sector will have a major role to play and the strategy would require modernisation and reorganisation of the computer division of the Electronics Corporation of India Limited (ECIL). The first and second phases can run in parallel, but the second may require a longer time frame to achieve the desired results. The large computer systems, the indigenous manufacture of which does not appear to be viable because of limited requirements, will naturally have to take third priority in the

next few years. Here regulated imports would clearly have to continue in the foreseeable future.

12.11 With a view to promoting the computer industry, a high level of tariff protection would have to be considered for the nascent indigenous industry. The present tariff structure which levies 40% custom duty on imported systems and an excise duty of 25% on indigenous systems (with only 10% instead of full 25% as countervailing duty on the imported systems) does not give adequate protection to the indigenous industry. Obviously it could not have been the intention of the Government to favour imported computer systems and the present tariff structure was possibly designed to give relief to importers of computer systems earmarked for export of software. It is, therefore, necessary to rationalise the present tariff structure. The Committee recommends that

- (i) all imported computer systems and such sub-systems, peripherals, accessories, software etc as are under production in the country be subject to import duty at 100% ad valorem; in addition, countervailing duty on par with the excise duty levied on indigenous manufacturers should also be imposed; furthermore, wherever even a higher level of protection is required for any specific item, peripheral or sub-system, the Department of Electronics can make suitable recommendations after a detailed review has been carried out;
- (ii) for the present and till the indigenous industry is in a position to market systems of value above Rs 50 lakhs, which as per present estimate may take 4 to 5 years, import duty on systems of value above Rs 50 lakhs inclusive of peripherals, accessories, software etc may continue to be levied at the present rate of 40% ad valorem. The countervailing duty should be reduced to 8% in line with the recommendation made in sub-para (iv) below. However, full rate of duty as in (i) above shall be levied on identifiable discrete units of the above imported systems which are being manufactured in India and already enjoy protective duty;
- (iii) all sub-systems, peripherals and accessories which are not being produced in the country should also be subject to an import duty of 40% with countervailing duty of 8%; and
- (iv) excise duty on all indigenous computer systems sub-systems, peripherals, accessories etc should be reduced from the level of 25% to the general rate of 8%.

In the earlier Chapter on 'Imports and Tariffs' it has been suggested that the import of items in the form of complete equipment should be strictly restricted; it has also been suggested that such imports should be subjected to a highly protective rate of import duty. It has been found necessary to make a departure in the case of computers because the import of computer systems costing more than Rs 50 lakhs will only be allowed after the proposal has been subjected to a very careful scrutiny and with full justification. After the necessity of such an import has been accepted there is no point in making the imported cost of such a computer system, which is essentially a management tool in one form or the other, unduly high through the imposition of a high import duty. Duty free import of certain category of components and sub-assemblies by indigenous manufacturers, as already recommended by the Committee in Chapter 6 on 'Imports & Tariffs' and lower rate of 40% duty on sub-systems, peripherals and accessories not being produced in the country will give adequate incentive to

indigenous industry to firmly establish the manufacture of systems upto a value of Rs 50 lakhs. and even beyond in a relatively short period. In view of this, lower level of protection at 40% on complete systems of value above Rs 50 lakhs, as proposed now, would need to be reviewed and revised periodically in step with the acquisition of capability by indigenous industry in that range also.

#### **Viable production and maintenance base**

12.12 The Electronics Corporation of India Limited, Hyderabad (ECIL) which is a public sector undertaking under the administrative control of the Department of Atomic Energy, is the major producer of Computers in India. A summary of the activities of the Corporation is given in Appendix 12.1. The activities of ECIL relating to computers account for about 20 percent of its turnover; its contribution to the programmes of the Department of Atomic Energy (DAE) also accounts for a similar proportion. Out of the balance, about 30 percent of the turnover relates to production of TV sets, another 20 percent to the supply of communication equipment and instruments to numerous other users in India and the remaining 10 percent to the production of components. This Corporation has an essential role to play in the task of developing self-sufficiency in the nuclear programme since it serves as a reservoir of nuclear electronics expertise.

12.13 The question whether ECIL should continue to be under the administrative control of the Department of Atomic Energy or whether it should be transferred to the Department of Electronics has been deliberated upon both by the Estimates Committee and the Public Accounts Committee of the Parliament. The Estimates Committee in their 66th and 85th Reports (Fifth Lok Sabha) had suggested that the question of transferring the administrative control over the Electronics Corporation of India Limited from the Department of Atomic Energy to the Department of Electronics should be considered. The Public Accounts Committee (221st report, Fifth Lok Sabha) felt that if both the computer corporations viz Computer Maintenance Corporation (CMC) and Electronics Corporation of India Limited (ECIL) were brought under the administrative control of the Department of Electronics, it should be possible to foster an integral linkage from the very inception and also avoid overlapping of responsibilities.

12.14 The objectives of the Computer Maintenance Corporation set up in December 1975 by the Department of Electronics include

- (i) maintenance of computers as a national effort,
- (ii) procuring and stocking of spares,
- (iii) rendering consultancy services,
- (iv) providing training on computers and maintenance planning and systems engineering,
- (v) standardising maintenance parts, and
- (vi) providing support systems and software.

Although it commenced its operation in October 1976, its operations become viable only after it took over the maintenance of the IBM computer systems from 1st June 1978, the date from which IBM ceased its manufacturing and maintenance operations in India. Presently, CMC is required to maintain any imported system at the request of the user. The

only other option available to the user is to maintain the system itself inhouse. Today CMC is, in a way, the exclusive national maintenance organisation for imported computers but over 60% of its work involves maintenance of obsolete IBM computers, which it has had to take over as its main business.

12.15 With large scale integration and single board construction, the cost of maintenance spares required to be stocked as a percentage of the cost of new machines is mounting up. With rapid changes in technology, it is no longer possible to do component level servicing; what actually happens is that the faulty boards are replaced by the maintenance organisation and these are then sent to the manufacturer for repairs. The Committee is, therefore, of the view that the corporate future of the CMC lies in its forging an organic bond with a viable indigenous computer manufacturer which in this case is obviously the ECIL. This can be achieved through the merger of the computer division of ECIL with CMC into a single public sector undertaking to be called the Computer Corporation of India which should be placed under the administrative control of the Department of Electronics. This is considered necessary because the feedback of information which the manufacturing undertaking would receive from the combined operations of import regulation and maintenance of computers will be vitally needed by it to plan the future marketing and manufacture of computers. Furthermore to the extent this Corporation captures the Indian market, the diversity in imported systems will gradually reduce. This, in turn, will lead to a certain amount of standardisation in the inventories which it will have to carry by way of maintenance spares. The Corporation will in addition to its manufacturing and maintenance and after sales activities, need to diversify into software development, training in systems support and providing consultancy services. Bold and imaginative corporate plans would need to be drawn up by the Computer Corporation of India so that India attains self-reliance in the whole range of computers as soon as possible; while doing so care will have to be taken to ensure that this Corporation does not go in for product lines which could be left with advantage to the small scale units or to some other units in the organised sector.

12.16 In the view of the Committee one of the points which requires serious consideration is the policy on the maintenance of imported computers by the users 'inhouse' or by the Computer Maintenance Corporation. Some representations were made to the Committee that competition in the area of maintaining imported computers should be permitted and other maintenance groups within the country be allowed to enter the field. Some of the manufacturers including potential manufacturers of computer systems under foreign collaboration also advanced the plea that it would be more economical if they were allowed to maintain not only computers of their manufacture but also those of their foreign collaborators which are in use in India. In view of the dependency of the maintenance groups on the manufacturer for spare parts and inventory planning, the Committee recommends that maintenance of computer systems including peripherals supplied by foreign collaborators of manufacturing units in India should also be permitted to be maintained by manufacturing cum maintenance organisations in India, in addition to the Computer Corporation of India. The choice should be left to the actual user.

#### **Policy and Procedure for import**

12.17 The existing policy for the procurement of computers is based on the approach that all users should first attempt to meet their inhouse requirements through computers which

are available indigenously and through drawing upon the facilities offered by the Regional Computer Centres. It is only thereafter that the question of import of computer systems is to be considered on merits. The policy for import of computers was aimed at securing the following objectives:

- (i) to keep the foreign exchange outgo as low as possible;
- (ii) to prevent any foreign company from acquiring a monopolistic position in India; and
- (iii) to provide systems at the lowest total cost, satisfactory from technical angle and from the point of view of availability of spares and maintenance.

The policy for import of computers also provides for special clearance for imports under special categories as given in Appendix 12.2. Under this policy Indian nationals returning from abroad and software export companies and entrepreneurs with technical background in India as also 'Export Houses' are allowed import of computers and data processing and conversion equipment against an obligation for export of software.

12.18 The present procedure for the import of computers is given in Appendix 12.3. The procedure envisages the following steps:

- (i) functional specifications drawn up by the user will be scrutinised by the Department of Electronics in terms of national priorities; the specifications thus finalised form the basis on which tenders are invited by the Department of Electronics.
- (ii) the tenders on receipt are evaluated by an Experts Committee constituted by the Department of Electronics; the user is invited though he is not a member of the Committee.
- (iii) thereafter a high powered Approvals Committee considers the recommendations of the Experts Committee and its decision is binding on the user.
- (iv) based on the above the user is authorised by the Department of Electronics to enter into a contract with the supplier; the draft contract, however, has to be vetted and approved by the Department of Electronics before it can be concluded by the user.
- (v) for the import of computers of value upto Rs 5 lakhs, the only requirement is to make a reference to the Department of Electronics and Directorate General of Technical Development for clearance of import application to Chief Controller of Imports & Exports without following the full procedure as outlined above.

12.19 Procurement of indigenous computers does not require any reference to the Department of Electronics, although advice may be asked for and taken by any Government department at its option.

12.20 The Committee feels that the basic tenets of the present policy on import of computers continue to be valid and do not call for any change.

12.21 Almost every one, who interacted with the Committee on the question of import of computers, was highly critical of the present procedure for the import of computers

which took anything from two to five years, was highly cumbersome and totally militated against expeditious procurement so vital in a sophisticated area of high technological obsolescence. The present policy guidelines and procedure for import prescribed by the Government stipulate that time taken for finalising the specifications and evaluating the tenders should not exceed three months. The Department of Electronics have however indicated that, even under ideal conditions, the time required for various activities in the procurement of computers would vary between 14 and 25 months as given in Appendix 12.4. It is seen that the actual time taken in the finalisation of the orders in respect of 82 cases was between 1 and 54 months for the completion of evaluation and from 6 to 64 months for complete procurement. Details of the 82 cases where data is available are given in Appendix 12.5. Details of 8 case histories on import of computer systems are given in Appendix 12.6.

12.20 The Committee finds that the present procedure for the import of computer systems is much too rigid and cumbersome and tends to defeat the very purpose for which computers are required. Once clearance for the import of a computer system has been given by a competent organisation, there is no reason why the normal procedure for the import of other items of equipment, the cost of which runs into hundreds of crores of rupees, cannot be applied to computers also.

12.21 It is understood that in the present arrangement, even after the configuration of a computer system had been cleared by the Electronics Department, it is necessary for the user to obtain the clearance from the respective State Government to ensure that the proposed computer system does not affect the interests of labour; this at best is a highly dilatory procedure; nor are the state Governments equipped to make an objective assessment of such proposals. The Committee therefore recommends that for deciding on all aspects of labour interests relating to computers, the Ministry of labour should constitute a cell in that Ministry manned by persons with knowledge of computer systems, the diversity of its applications and its impact on productivity, labour displacement etc. The cell should work in close consultation with the Department of Electronics so that in the initial stages of the finalisation of the configuration of a computer system this extremely important aspect is fully taken care of.

12.22 Taking the above into account and after careful consideration of all the relevant factors the Committee recommends the following rationalised procedure for adoption in respect of procurement of imported computers:-

- (i) in respect of those computer systems where the estimated value is more than Rs 50 lakhs, the user will draw up detailed specifications and systems configuration which will be forwarded to the Department of Electronics;
- (ii) the specification and the functional configuration will then be critically examined by the Department of Electronics in consultation with the user, the Cell in the Ministry of Labour, where necessary, and the Computer Corporation, the last being essential where maintenance is to be done by the Corporation;
- (iii) if based on the above examination the proposal is found to be justified, then the Department of Electronics will clear the Computer System for import; attempt should be for the Department of Electronics to arrive at a decision on such a proposal within a month or two of the receipt of the application;

- (vi) on receipt of the clearance from the Department of Electronics, the user shall float global tenders broadly in the manner prescribed by the Department of Electronics from time to time;
- (v) the user will, before placing the order, get the selected system and the draft contract approved by the Department of Electronics which will consult, where necessary, the Computer Corporation so as to ensure that the contract covers purchase of equipment, peripherals, spares maintenance, warranty etc, the time taken for giving such approval should generally not be more than a month;
- (vi) on the basis of the approval by the Department of Electronics, the application for import licence will be submitted to the Electronics Approval Board as per normal procedure;
- (vii) where the c.i.f. value of the system does not exceed Rs 50 lakhs approval for import clearance will be obtained from the Department of Electronics without the necessity of having to go through the above procedure as is being done at present for systems below Rs 5 lakhs in value; the time taken for such approval should generally not be more than one month.

12.23 The committee has earlier recommended the continuation of the policy for the import of computers against an obligation for export of software and the special clearance for such imports. The Committee further recommends that notwithstanding the verification of the end use of such imports by the Chief Controller of Imports & Exports, the use of such computers should be monitored by the Department of Electronics also and the results thereof published in the annual reports of the Department.

#### **National organisations and national efforts**

12.24 The decision to set up Regional Computer Centres (RCC) was taken in 1970; the intention was that they should get preference over individual installations and they should be located within or in close association with educational institutions. The Regional Computer Centres (RCC) are planned to provide:-

- a) Export oriented applications;
- b) applications of national importance in priority sectors such as agriculture, energy, oil transportation, steel, coal etc;
- c) regional planning applications of State Governments and also of other neighbouring states;
- d) production - based and optimal resource utilisation applications in industry;
- e) higher level computer training and research; and
- f) commercial applications contributing to efficient management.

Three Regional Computer Centres at Calcutta, Chandigarh and Pune have so far come up, but only the one at Calcutta has become really operational. The one at Calcutta is being used by over 70 customers for over 21 hours a day with a few service terminal facilities located at Ranchi. It has been able to supplement and not supplant the use of inhouse computers in the industrial and commercial establishments to some extent. But what it has been



able to achieve is to bring home to the potential users in the country the utility of computers and to stimulate the demand for wholtime use of inhouse computers.

12.25 The Regional Computer Centres have been set up as autonomous scientific non-profit making societies, under the Societies Registration Act of the respective states, for development of Computer Science and Technology. The management structure of the Regional Computer Centres is given below:-

- (a) Board of Trustees : The ownership of all properties of RCC vests with the Board of Trustees. The Trustees comprise of representatives of organisations which funded the initial setting up of the RCC.
- (b) Executive Council : All administrative powers for the proper functioning of the RCC are vested in the Executive Council. The Council comprises of representatives of organisations which funded the RCC, State Governments served by the respective RCC and two major users of the Computer system of the Centre.
- (c) Advisory Board : For technical guidance on systems development by RCC an Advisory Board is set up comprising of persons of recognised national eminence in the field of Electronic Data Processing.

12.26 The Committee recommends that the present policy for setting up Regional Computer Centres is basically a sound one and may be continued while adapting it to the changing pattern of user demands; this, of course, has to be a continuous process.

#### **National Centre for Software Development & Computing Techniques (NCSDDT)**

12.27 Towards the end of 1974, a National Centre for Software Development and Computing Techniques (NCSDDT) was set up by Government of India with the assistance of UNDP to the extent of \$ 2.646 million (Rs. 2.2 crores); it was included as a project in the Fifth Five Year Plan of the Department of Atomic Energy. The basic objective of the NCSDDT is to contribute to the growth of the computing technology and computational practices in India as a national resource.

12.28 The Centre is located in and managed by the Tata Institute of Fundamental Research (TIFR), a registered Society financed entirely by the Government of India through the Department of Atomic Energy. Considering the necessity for close coordination between NCSDDT and other national/regional Computer Centres and on the advice of the Planning Commission, in a meeting held on June 25, 1976, it was decided that the NCSDDT should be transferred from the Department of Atomic Energy to the Department of Electronics. Besides coordination, the genesis of this suggestion was to ensure optimal utilisation of resources, avoidance of duplication of effort and effective utilisation of the knowhow generated at each centre. It was further decided that the expenditure incurred till then on the centre as well as the requirement of funds for the remaining period of the Fifth Plan should be shown under the Department of Electronics; accordingly a transfer was effected from the budget of the Department of Atomic Energy to that of the Department of Electronics. Funds for the centre are presently given as grant-in-aid to TIFR directly from the Department of Electronics from within the budgetary provisions approved by the Planning Commission and the Ministry of

Finance. The Electronics Commission approved the transfer of NCS DCT from the Department of Atomic Energy to the Department of Electronics after being informed by the Chairman of the Electronics Commission that, while TIFR would manage the Centre, the Department of Electronics would provide all the financial, administrative and policy aspects of the actual functioning of the Centre including responsibility to the Comptroller & Auditor General for the proper use of the funds and the larger responsibility for the policies and programme of the Centre particularly to the Parliament.

12.29 The NCS DCT became operational in the last quarter of 1975. The facilities at the Centre include a large dual processor computer system—DEC 1077; the Centre also operates an interactive graphic facility. These systems are used for program-development from time-sharing terminals and for production runs of large scientific and engineering programmes which cannot be executed on smaller systems. At present, 763 programmers from 461 institutions regularly use the computing facilities.

#### **National Informatic Centre (NIC)**

12.30 Originally it was planned to set up three major computer centres at Bombay, Delhi and Bangalore under the UNDP country programmes. The NCS DCT came up at Bombay as a National Centre. The Centre at Delhi was to be located at Jawaharlal Nehru University (JNU) and was to be a joint venture involving JNU, Department of Electronics and the principal user agencies. Subsequently, this Centre came up in Delhi but as a departmental undertaking of the Department of Electronics and has now developed into the National Informatic Centre. The Centre at Bangalore has failed to come up. The National Informatic Centre (NIC), also set up with UNDP assistance, aims at providing a computer network infrastructure for enabling the development of interactive computerised data bases for various ministries/departments and related organisations of the Government of India. It is evolving appropriate information systems for Agriculture, Education, Energy, Finance, Health, Irrigation, Rural Development and Manpower as well as a socio-economic index information system. A powerful computer system is expected to be installed by the end of 1979: this will enable NIC to offer, in addition, services to users in Delhi which the Regional Computer Centres are designed to provide in their respective regions.

12.31 The Committee is of the view that the National Centre for Software Development and Computing Techniques (NCS DCT), the National Informatic Centre (NIC) and the Regional Computer Centres (RCC) have great potential for generation and application of software for multifarious use of computers and network system, applications in the area of graphics and designs and in generating computer manpower. They have complementary roles in the national development effort and the optimal utilisation of computers in the country. There is a great need for a unified structure to coordinate the activity plans of the national facilities set up with Government funds. Similarly, there is need for professional guidance in forward planning necessary to keep the role of the organisations contemporary and meaningfully related to national efforts. The Regional Centres even in performing a state level role and assisting local bodies, Electricity Boards etc. have to remain a part of the national computer effort. All this requires effective coordination by a single organisation or Department. Coordination of efforts in the computer centres spread all over the country will not only give a boost to the export of software but would also help to develop the requisite level

of trained manpower. The responsibility for this coordination must devolve on the Department of Electronics, but at the same time it should ensure that this in no way impinges on the functional autonomy of these computer centres.

12.32 The Committee is of the view that the transfer of the NCSDCT to the Department of Electronics was a step in the right direction but the follow up action for linking the NCSDCT to the Department of Electronics administratively still remains to be implemented. The Committee recommends that the National Centre for Software Development and Computing Techniques (NCSDCT) be hived off from TIFR and set up immediately as an autonomous registered society, administratively linked to the Department of Electronics.

12.33 The Committee is of the view that a computer advisory panel should be set up in the Department of Electronics directed by the Secretary, Department of Electronics and with a cross section of computer professionals, manufacturers, users, scientists and technologists engaged in research and development, represented on it to guide and promote the national computer effort.

12.34 The Committee would also recommend that the whole area of computer development, maintenance and related issues discussed in this Chapter be subjected to a review after three years in the light of the growth and changes that may take place during the period.



## CHAPTER 13

### CENTRAL PUBLIC SECTOR UNDERTAKINGS

Major Central Public Sector Undertakings in the field of electronics are:—

Undertaking	Ministry to which attached
(a) Indian Telephone Industries Ltd (ITI)	Ministry of Communications
(b) Hindustan Teleprinters Ltd (HTL)	-do-
(c) Bharat Electronics Ltd (BEL)	Department of Defence Production
(d) Hindustan Aeronautics Ltd, Electronics Division, Hyderabad (HAL/HD)	-do-
(e) Bharat Dynamics Ltd (BDL)	-do-
(f) Electronics Corporation of India Ltd (ECIL)	Department of Atomic Energy
(g) Instrumentation Ltd, Kota (IL)	Ministry of Industry
(h) Central Electronics Ltd, Ghaziabad (CEL)	Department of Science & Technology
(i) Computer Maintenance Corporation (CMC)	Department of Electronics
(j) Electronics Trade & Technology Development Corporation (ETTDC)	-do-
(k) Semiconductor Complex Ltd (SCL)	-do-

Of the above undertakings, the Semiconductor Complex Ltd is still in the construction stage.

13.2 Annexure 13A to this Chapter gives the comparative statistical information relating to total production of these undertakings, share of their captive market, employment and investment.

13.3 Major items of equipment and systems manufactured by these public sector undertakings are given in Appendix 13.1. Except for Instrumentation Ltd, Kota (IL) and Bharat Dynamics Ltd (BDL); production of other units consists mostly of electronic and/or telecommunication equipment, systems and components. The value of production in these units during the year 1977 was about Rs. 190 crores constituting about 40 per cent of the total electronic production of Rs. 508 crores in the country; however, what is more important is that their production constitutes a very large percentage of the total output of professional grade electronic equipment, systems and components in the country; this is an area in which some of the public sector units have already built up a degree of competence and expertise. Many of the public sector units have also established inhouse R & D capability; they also maintain close association with other R & D establishments in the country.

13.4 To start with, many of the public sector units such as Indian Telephone Industries Ltd (ITI), Bharat Electronics Ltd (BEL), Hindustan Aeronautics Ltd (HAL), Bharat Dynamics Ltd (BDL) and Electronics Corporation of India Ltd (ECIL) were set up by the Ministries/Departments concerned as captive production units to meet their specific require-

ments; most of the items of equipment and systems were made under licence except in the case of ECIL. Gradually, as these units developed their own capability for inhouse R & D, for innovation and adaptation and for product development, other users of electronic equipment such as the All India Radio, the Department of Civil Aviation, and the Department of Meteorology started taking advantage of this capability by getting some of their requirements of equipment and systems from these units. Thus, over a period time, a certain amount of diversification in the product-mix of these units took place, and the proportion of the equipment supplied to users other than the parent customers increased. Presently 75 to 80 per cent of the sales of ITI and HTL go to P & T, about 60 percent of BEL's production of equipment (excluding components) goes to Defence and about 20 per cent of ECIL's production goes to the Department of Atomic Energy. The products of IL, Kota, and Semiconductor Complex are not directed towards any particular user department.

13.5 Central Electronics Ltd (CEL) was set up under the Department of Science & Technology in June 74 with the main objective of undertaking the manufacture of electronic components, materials and systems using the indigenous technology developed in the CSIR and other national laboratories. The corporate plan of this public sector undertaking includes the manufacture of ferrites, ceramics, special electron tubes, liquid crystal displays, power electronic equipment, microwave ovens, as well as analytical and laser systems. Till March 1979, the total investment on this project was Rs. 5.20 crores with an output of Rs. 0.93 crores in 1978-79; the cumulative loss carried forward till the end of financial year 1978-79 was of the order of Rs. 1.24 crores. This public sector undertaking is still in a nascent stage of development.

13.6 The Committee has elsewhere highlighted the importance of a sound base for the manufacture of electronic components as an essential pre-requisite for the rapid development and growth of the electronics industry. It is, therefore, necessary that all possible measures are taken by the Government so that the highly laudable objectives for which the Central Electronics Ltd was set up are achieved as early as possible.

13.7 The corporate plans of the public sector undertakings for the coming years indicate overlap in the areas like communication, computer, telemetry and systems engineering. The overlap by itself is not undesirable, particularly in areas not requiring high technology or investment; in fact, such overlap could promote greater competition and therefore better service to the customer. However, in areas of high sophistication and high level of investment, overlap needs to be avoided to ensure proper utilisation of our meagre resources both in terms of money and manpower. Hence, there is a need for coordinating the corporate plans of the various public sector undertakings.

13.8 The Committee is of the view that this can be best achieved through the formation of a Planning and Coordination Group, under the Department of Electronics, as proposed in Chapter 14 of this report on 'Organisational Structure'; this group, when properly structured, can play an important coordinating role in the growth and development of the public sector units producing electronic items without in any way interfering in their autonomy.

13.9 It would also be clear from the foregoing that in most cases it is the user who has the ultimate say in the choice of the equipment required by him; the choice of technology,

therefore in the case of public sector units, whether it is developed or acquired, is largely determined by this over-riding consideration. Similarly, product support facility is another requirement which users view as a vital service for the maintenance of the equipment and the systems. Hence, to keep up with the frequent changes in user requirements and the associated technology and in order to ensure efficient product support, close and continuous interaction amongst the customer, the production undertaking and the user Ministry has to be maintained. This can only be effectively ensured if the undertakings are administratively linked to the user Ministries concerned.

13.10 Taking all the relevant factors into account, the Committee recommends that the existing linkages of the public sector undertakings with the Administrative Ministries concerned should not be disturbed, except for the suggestion which has already been made in Chapter 12 of this report on 'Computers' that the Computer Division of the Electronics Corporation of India should be merged with the Computer Maintenance Corporation and a new undertaking 'Computer Corporation of India' formed under the administrative control of the Department of Electronics.



## Central Public Sector Undertakings in the field of Electronics

Company	1975-76					1976-77					1977-78				Assets	
	Production (Rs. Crores)					Parent customer	Others	Parent customer	Others	Parent customer	Others	No. of employees	Gross Block	Net Block	(Rs Crores)	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1. ITI	74.25	74.25	86.71	88.96	90.17	84% (P & T)	16%	81% (P & T)	19%	79% (P & T)	21%	25,861	39.60	24.93		
2. BEL	62.18	62.18	66.01	75.00	72.87	55% (Defence)	45%	41% (Defence)	59%	37% (Defence)	63%	16,562	56.28	24.82		
3. ECIL	29.01	29.01	32.38	33.73	34.54	20% (DAE)	80%	20% (DAE)	80%	20% (DAE)	80%	6,342	20.24	8.59		
4. HTL	5.05	5.05	5.48	5.45	5.27	72% (P & T)	28%	71% (P & T)	29%	79% (P & T)	21%	1,974	4.66	2.40		
5. IL	5.74	5.74	7.54	9.31	10.63	100%	100%	100%	100%	100%	100%	2,423	11.04	7.00		
6. HAL/HD	10.43	10.43	10.29	11.48		100% (Defence)		100% (Defence)		100% (Defence)		3,188	12.41			
7. CEL	0.04	0.04	0.08	0.35	0.94		100%		100%		100%	646	3.36	2.49		
8. BDL	3.20	3.20	5.53	5.44		100% (Defence)		100% (Defence)		100% (Defence)		1,223	3.57	3.30		
9. ETTDC*	1.79	1.79	6.49	11.54	12.14		100%		100%		100%	133	9.43	6.29		
10. CMC*				0.70	5.47						100%	554	2.97	2.54		
11. SCL				Not yet in production												

\*Non-manufacturing companies. Figures indicate turnover  
Cols. 6 to 11 give user-wise sales

## CHAPTER 14

### ORGANISATIONAL STRUCTURE

In the schedule to the Allocation of Business Rules framed under Article 77 of the Constitution, the following subjects have been allocated to the Department of Electronics:

- (i) Development of electronics and coordination amongst its various users.
- (ii) All matters relating to the personnel under the control of the Department.
- (iii) Coordination of requirements relating to electronic processing equipment (Computers)
- (iv) All matters concerning computer based information, technology and the processing including hardware and software, standardisation of procedures and matters relevant to international bodies such as IFIP, IST, TCC.

This places a very heavy and all embracing responsibility on the Department of Electronics; essentially the development of electronic industry includes initiation of research & development programmes and manpower development, both of which would ultimately lead to self-reliance, growth of the small scale and organised sectors of the industry including planning of long term investments in these sectors as well as coordination of requirements with other sectors of the economy for items of electronic equipment and systems necessary to enlarge the application of electronics. In discharging its specific responsibility of coordination, the Department of Electronics has to interact with other Ministries and Departments and with the industry itself both in the public and the private sectors; the Department has also to interact with the trade in relation to import and export policies, Department of Revenue in relation to matters of fiscal policy and the Financial Institutions in relation to the promotion of the industry. These responsibilities will further increase if some of the important recommendations made in this report are accepted by the Government. The Committee, therefore, feels that the organisational structure of the Department should be suitably strengthened so as to enable the Department to discharge these onerous responsibilities fully. At the same time it is necessary to review the powers and the work allocated to the Electronics Commission so as to avoid any overlap of functions as between the Department and the Commission.

14.2 It would appear that when the Department of Electronics, and a few months later the Electronics Commission, was created in the year 1970-71, the Government felt that the best course would be to follow the organisational pattern of the Department of Atomic Energy including the Atomic Energy Commission as that, perhaps, was the only other model for scientific departments which was available at that time. A copy of the Government Resolution setting up the Electronics Commission, which also lays down the powers and the broad list of responsibilities entrusted to the Commission is at Appendix 14.1; relevant extracts from the note which formed the basis for this Resolution are also given in Appendix 14.1. A comparative analysis of the powers, duties, responsibilities and work allocated to the Electronics Commission and the Department of Electronics is given in Annexure 14A to this Chapter; from the scrutiny of this Annexure it will be found that there are certain areas where there is obvious overlap of functions between the Department and the Commission. The present



organisational structure of the Department of Electronics and the Electronics Commission is given in Appendix 14.2

14.3 It would be pertinent to point out here that duties, responsibilities and the scope of the work entrusted to the Department of Electronics (including the Electronics Commission) have little in common, in form or content, with those of the Department of Atomic Energy. The budget of the Department of Electronics for the last 8 years (Appendix 14.3) would show that its activities are of a different order of dimension, financially very much smaller but much wider in scope, than those of the Department of Atomic Energy. Moreover, essentially, the Department of Atomic Energy is a mission oriented organisation, planning and executing its programmes almost totally within its own resources and with limited interaction with other organisations of the public. Therefore, it would be obvious that the organisational structure of the Department of Electronics would have to be substantially different from that of the Department of Atomic Energy, to subserve its functions.

14.4 The Committee has already recommended the formation of an Electronics Approval Board in Chapter 5, on 'Industrial Approvals'. The Committee has also recommended, in Chapter 10 on 'Research, Development and Manpower', the setting up of an Electronics Research and Development Organisation (ERDO) under the Department of Electronics to give a purposeful direction to and coordination of all R&D activities in the country. In carrying out its activity of giving purposeful direction to R&D efforts and in filling up gaps in R&D, the ERDO would be entrusted with the following responsibilities:

- (i) to initiate and monitor specific and time bound R&D projects in existing R&D institutions/establishments depending upon their areas of specialisation; such projects could be funded by ERDO to the extent necessary; gradually ERDO could provide assistance in the form of qualified personnel, equipment, materials etc depending upon the specific requirements of each project,
- (ii) to set up new laboratories and other R&D facilities in areas where such facilities do not exist in the country or are grossly inadequate,
- (iii) to initiate action for the development of manpower with suitable experience and technical competence,
- (iv) to convert the fruits of indigenous R&D into industrial products, equipment and systems. This would require inter alia
  - (a) development and testing of prototypes either 'inhouse' or in association with the industry depending upon the requirement of each project,
  - (b) setting up or acquiring pilot plant facilities, where necessary, as in (a) above,
  - (c) providing funds to the extent necessary for (a) and (b) above,

14.5 It is axiomatic that the success of any new organisation—be it an R&D organisation or an industrial project—ultimately depends upon the leadership provided by the head of the organisation. The success of ERDO would also, therefore, depend upon the person who is chosen to head this organisation particularly in its formative stages. The head of ERDO should therefore, be an eminent electronics engineer or technologist of proven competence and an established reputation; he should be designated as Director General (ERDO).

14.6 An outline of the proposed organisation for ERDO is given in Annexure 14B to this chapter; obviously this organisation will have to grow gradually with the passage of time. To start with, the following should constitute the main functional divisions of ERDO, each headed by a Director :

- (i) materials,
- (ii) components and devices including microwave devices,
- (iii) equipment—its main responsibility will be development in specialised areas such as navigational aids,
- (iv) systems,
- (v) engineering resource, manpower development & coordination.

14.7 ERDO will have to start from scratch; it will therefore, have to attract scientists, engineers and technologists of proven merit. To achieve this the Committee recommends that the Government should be willing to provide adequate compensation to attract Indians of exceedingly high technological competence presently working abroad. In the ultimate analysis, this approach would give dividends to the nation in the form of technological self-reliance in a highly sophisticated area which will be out of all proportion to the additional expenditure which may be incurred on some individuals. The Committee considers this to be a matter of crucial importance in the development of electronics industry in the country.

#### **Research & Development Board**

14.8 To provide guidance and direction and in order to ensure proper coordination in respect of the R&D activities of ERDO, the Committee recommends that an R&D Board should be constituted in the Department of Electronics with the following composition :

- (i) Secretary, Department of Electronics —Chairman,
- (ii) Secretary, Department of Atomic Energy,
- (iii) Secretary, Department of Space,
- (iv) Scientific Adviser to the Defence Minister,
- (v) Secretary, Department of Science & Technology,
- (vi) Secretary, Technical Development,
- (vii) Secretary, Department of Expenditure, Ministry of Finance and
- (viii) Chairman, Post and Telegraph Board

#### **Planning & Coordination Group**

14.9 The Committee has earlier recommended in the Chapter on 'Central Public Sector Undertakings', the setting up of a Planning & Coordination Group under the Department of Electronics for coordinating the growth and development of the public sector units producing electronic items and proper utilisation of our meager resources in areas of high sophistication and high level of investment. This applies also to the units of the Electronics Development Corporations under the State Governments. Such a group would also

facilitate the working of the Department of Electronics in ensuring effective coordination with other Ministries/Departments intimately concerned with the development of the electronics industry. This group can also give guidance in respect of work connected with "Joint Commissions" with other countries which in some cases presents good prospects for the development of the electronics industry to the mutual advantage of both the countries. This group should be headed by the Secretary, Department of Electronics, and should have representation from the concerned Ministries at the level of Joint Secretaries (or equivalent) and above.

14.10 In the context of the recommendations made earlier, the Committee is of the view that there is no justification for the Electronics Commission to continue in its present form. Instead, the Committee would recommend that it would be more useful to have a body, free from executive functions, charged with the responsibility of advising the Government on the development of Electronics in the country as a long term perspective covering the total spectrum. This body should accordingly be named the 'Electronics Development Commission'. The Commission, which would be a purely advisory body, should be composed of leaders in the industrial and scientific fields, leading academicians, economists and technologists. The Committee would recommend that the Secretary, Department of Electronics, should be the Chairman of the Electronics Development Commission and its membership should be limited to not more than twelve. The members should be appointed by the Prime Minister on the recommendation of the Chairman of the Commission.

14.11 The Committee further recommends that the Electronics Development Commission does not need to have any organisation administratively and financially under it; service facilities to the extent required can be rendered by the Department of Electronics. Separate identity of the existing organisations under the Electronics Commission should be immediately merged in the Department of Electronics.

14.12 While setting up the Electronics Commission in 1971, the Government had vested it with the powers of the Government of India to facilitate its work. Exemption from UPSC, DGS&D, CPWD, CCPS, EFC & PIB procedures was also given to the Commission keeping such an end in view. The Commission was also freed from all non-essential restrictions and inelastic rules and given full financial and executive powers. The state of development of Electronics in the country is still at a nascent stage and to achieve the stupendous targets set before the Department of Electronics for achievement in the next five years the Committee would strongly urge that the procedural dispensations given to the Electronics Commission and the special powers vested in the Electronics Commission should continue to be available to the Department of Electronics.

14.13 While setting up the Electronics Commission, Government had decided that in the area of personnel policies, except for the practices adopted by the Department of Atomic Energy with regard to grant of extra increments, rationalisation of the dates of increments, merit promotions, foreign delegations and deputations and physical fitness for employment, which will also apply to the Department of Electronics, in all other matters only normal rules and orders of Government should apply except to the extent indicated in special rules and procedures that may be laid down by the Electronics Commission. The scientific and technical

staff employed in the Department of Electronics should have been governed by the normal rules and no special rules and procedures have been laid down by the Electronics Commission for them. For some reason this has not been done so far and with the exception of a few who are on deputation, all of them are on contract service similar to the practice in the Tata Institute of Fundamental Research. After taking all relevant factors into account, the Committee recommends that except for appointments at relatively higher levels, such as heads of divisions, which should be on contract or tenure basis for a fixed period, all other appointments must be on regular basis save in exceptional cases. The Committee also recommends that the scheme for merit promotion and grant of extra increments should also be introduced in the Department of Electronics where the staff are engaged in activities which are predominantly of research, design and development nature, without any further delay.

14.14 A statement listing out the financial powers of present Electronics Commission, Chairman, Electronics Commission and the Ministries/Departments of Government of India acting through the Secretary of the Department is given in Appendix 14.4. The financial powers delegated by the Commission to the Chairman and Member (Finance) are given in Appendix 14.5. All other powers exercised by the Chairman, and they form the bulk of his powers, are by virtue of his being Secretary, Department of Electronics, as in any other Department of Government of India. The Committee recommends that consequent on the suggested restructuring of the Electronics Commission, the normal system of financial control existing in other Departments and Ministries of the Government of India should be adopted in the Department of Electronics with an Integrated Financial Adviser at an appropriate level reporting to the Secretary, Department of Electronics and to the Secretary (Expenditure) in the Ministry of Finance as in other Ministries and Departments.

14.15 One of the powers vested in the Electronics Commission by the Government in the Resolution of 1971, setting up the Commission, was to scrutinise or do post facto review of proposals for the import of high value electronics items by the Ministries/Departments and institutions in the country. Accordingly the Department of Electronics had directed all the Ministries/Departments of the Government of India and the centralised agencies like CCI&E, DGS&D etc., to obtain clearance from it for import of electronic equipment, including electronic components in non-electronic equipment, where their value exceeds Rs 5 lakhs. Almost all Government departments and organisations represented to the Committee that this clearance procedure has resulted in delays and difficulties leading to frustration and friction. The Committee has already recommended that on all matters connected with electronics industry, the Department of Electronics should be the decision making authority, including scrutiny from indigenous angle presently being done by the DGTD. The Committee recommends that the Department of Electronics should carry out this scrutiny in respect of banned items only, in keeping with the practice followed by the DGTD. No further clearance with reference to the value of items above Rs 5 lakhs is necessary, which is presently done in regard to the restricted items and even items on Open General Licence.

14.16 Consequential changes within the Department arising out of the recommendations made earlier in this Chapter is a matter for Secretary, Department of Electronics to consider and take action on.

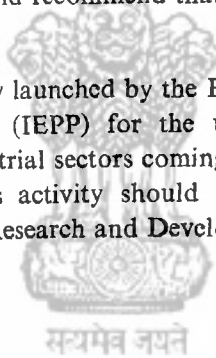
## **National Radar Council**

14.17 The National Radar Council (NRC) was set up in the Department of Electronics by the Government, in January 1974, to ensure proper coordination of the planning and R&D activities in the field of Radars and Sonars and to meet the requirements in the defence and civilian sectors in an integrated manner, on the basis of maximum self-reliance. The background note leading to the formation of NRC is given in Appendix. 14.6. The Committee is of the view that with the setting up of the Electronics Research and Development Organisation (ERDO) recommended earlier, the functions of NRC can be fully discharged by ERDO. The Committee, therefore, recommends that there is no need for NRC to continue in its present form.

## **Defence Project Cell**

14.18 In September, 1974, the Electronics Commission set up the Defence Project Cell in the Department of Electronics. This Cell is at present engaged on Defence R&D projects concerned with the development of computer software and systems engineering. The development cost is of the order of Rs 7 crores. The expenditure is initially to be met from the budget of the Department of Electronics to be later reimbursed by the Ministry of Defence on delivery of the systems. The Committee would recommend that these activities should continue in the present form as a part of the ERDO.

14.19 Another similar activity launched by the Electronics Commission is the 'Industrial Electronics Promotion Programme' (IEPP) for the use of control instrumentation and industrial electronics in major industrial sectors coming under other Ministries/Departments. The Committee recommends that this activity should also in future appropriately become the responsibility of the Electronics Research and Development Organisation.



## Functions, duties, responsibilities and powers of

Department of Electronics				and	Electronics Commission		
Executive	Industrial Approval	R&D	Planning & Coordination	Industrial Approval	Executive	R&D	Planning & Coordination
1.	development of electronics	1. full executive and financial powers	direct promotional and regulatory measures for quality production and satisfactory prices	dovetail all R&D proposals to national effort	information from all Ministries/Depts. on technical features and performance characteristics of their equipment		
2.	exemption from UPSC, DGS&D, CPWD, CCPS and Deptt of Personnel procedures	regulation and supervision of industrial licensing, import, foreign collaboration, capital goods	coordination amongst users	2. freedom from all non-essential restrictions and needlessly inelastic rules	design and implement policies and procedures on technology and its import and develop self-reliance in industry	survey, plan and finance R&D in public and private bodies	information on financial allocation for electronics on R&D and industrial activities
3.	exemption from reference to Expenditure Finance Committee & Public Investment Board			3. within the limits of budget approved by Parliament, all administrative and financial powers of Govt of India	responsible for operating industrial and import licensing policies and procedures for electronics industry	applying R&D to production, promoting indigenous technology, subsidising production with local knowhow	information on electronics imports, from Ministry of Industrial Development

4. **Note:** Industrial Approval applications will be disposed off by Ministry of Industrial Development under normal procedure, a special sub-committee of Licensing Committee being set up if necessary

4. launching new schemes of special significance in relaxation of all procedures

clearance for import of high value items through procedure for scrutiny or post facto review

promote indigenous plant and machinery

information on licences and imports from DGT & CCIE

5. policies on electronics with international implications

promote appropriate technology

information from all Ministries and Organisations on short and long term requirements in electronics

6.

advise on patents and designs

technical and financial assessment of national needs in electronics and overall integration



7.

survey, plan and approve in public, private & small scale sector production of materials, components, equipment and systems

8.

assess and provide for manpower needs

9.

generate employment opportunities

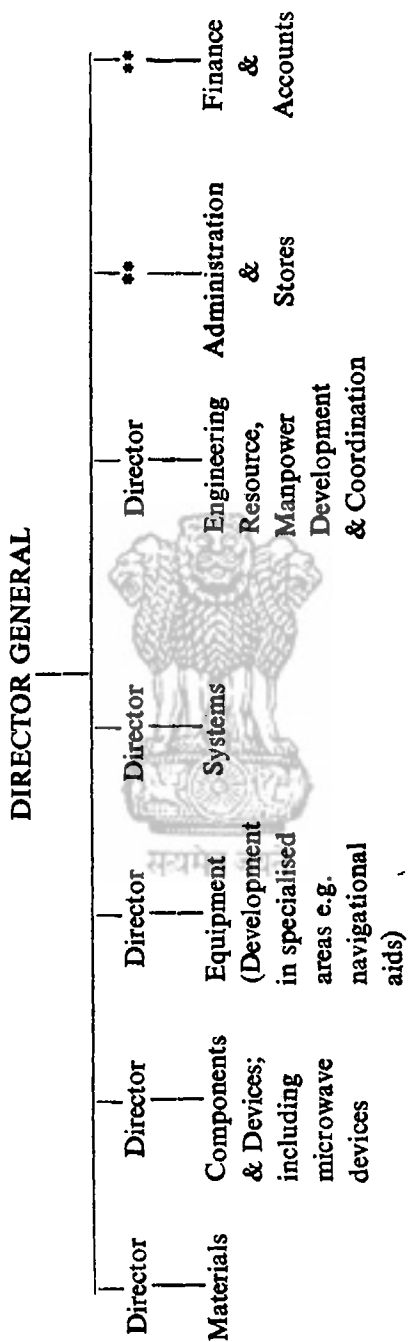
10.

expand application of electronics in national economy

11.

promote self-reliant electronics industry.

**Organisational Structure of  
Electronics Research and Development Organisation (ERDO)**



♦♦ to be headed by an officer of requisite status/level.



## CHAPTER 15

### CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

The Committee has completed, in accordance with its terms of reference, a review of the policies, procedures and institutional framework in the Department of Electronics (including the Electronics Commission). In undertaking this review, consultations in depth were held with the electronics industry in all its segments both in the private and the public sectors, Government agencies concerned with electronics directly or indirectly, R&D institutions and professional experts. As a result, the Committee has come to the conclusion that it is possible to achieve much higher and faster rates of growth in the production and use of electronics in the country than has been the case hitherto. The objective can be realised if the existing restrictive climate is replaced by one of positive promotion, consistent with the national socio-economic priorities.

15.2 Towards this direction, the Committee has recommended a package of measures in the area of industrial approvals, import and tariff policies, fiscal and financial arrangements and exports. The essence of this package is the dismantling of unnecessary controls, restrictions and regulations but with an overall coordinated and integrated approach on growth, with due regard to specific strategies of development. Multi-channel and multi-agency approvals seem to have retarded growth in the past. Streamlined procedures have, therefore, been suggested as well as approvals by a single-point nodal agency, moved by group dynamics so that the Department of Electronics can be held fully accountable for the development of the electronics industry in the country. In respect of the Free Trade Zone, it has been clearly brought out that unless we offer similar facilities, as some of our neighbouring countries do, it will continue to languish. Measures for strengthening the role of the small scale sector, especially in the production of certain types of consumer electronics and in employment intensive assembly operations, have been clearly brought out. Its complementarity to the organised sector has also been stressed.

15.3 Substantial but selective investments in production-oriented research and development programmes have been highlighted; so also the need for the development of suitable manpower. Specific measures for standardisation and quality assurance have been suggested.

15.4 To obviate stagnation in the area of computers, specific steps have been proposed for stimulating production and use of computers with due regard to the accelerated development of key sectors of the economy but fully consistent with our socio-economic requirements including the sensitive issue of employment potential. Streamlining of procedures for import of such computers which do not lend themselves to economical production in the short term, has been suggested. An organisational re-structuring of the facilities in the public sector for the manufacture and maintenance of computers has also been proposed. The need for greater coordination at the national level for more effective utilisation of costly and powerful computer systems set up in the country has been emphasised.

15.5 A series of measures for the restructuring of the present Department of Electronics, the Electronics Commission and the organisations functioning under them have been suggested with a view to ensuring clearly demarcated functional and organisational responsibilities.

ties. With the implementation of these measures, Department of Electronics assisted by the high - powered interministerial Boards which have been recommended, would have the primacy of policy direction and implementation. The Electronics Development Commission replacing the present Electronics Commission, would essentially be a high level advisory body, free from executive responsibilities, with an enlarged membership concerning itself with studies of and advice on perspective planning for self-reliance, integrated development of the electronics industry, the inter-sectoral applications of electronics and R&D efforts, Its new role would be that of a 'think tank'. Consequently, the existing organisations supporting its activities will be merged in the Department of Electronics.

15.6 A summary of the conclusions and recommendations made by the Committee is given below.

**Electronics :  
the pace setter**

- (1) The concept of rapid development of the electronics industry which is a forceful catalyst for the growth of our national economy fits in ideally with our national priorities and resource endowments (para 1.7).

**Industrial Approvals**

**Electronics  
Approval Board**

- (2) In electronics, the emphasis so far seems to have been more on regulatory rather than on developmental and promotional aspects. The Committee has reluctantly come to the conclusion that this situation in electronics seems to have stifled initiative and enterprise, even in the case of small entrepreneurs and self employed technocrats, by subjecting them to time-consuming procedures and multi-channel scrutiny (para 5.1).
- (3) The Committee is convinced—and so are most of the industry groups and professional experts whom it met - that if the growth of the electronics industry in the country has to gain momentum the first step that would need to be taken would be to dismantle the present control structure to the extent that it does not subserve the accepted socio-economic objectives (para 5.2).
- (4) An Electronics Approval Board be set up in the Department of Electronics with Secretary, Department of Electronics as Chairman, Secretaries in the Ministry of Communications, Ministry of Commerce, Department of Industrial Development, Department of Defence production, Planning Commission and the Department of Economic Affairs or their senior authorised representatives not below the level of Additional Secretary (or Joint Secretary, where post of Additional Secretary does not exist) and the CCI&E as members. The Board should be delegated in respect of electronics, all the powers which are now being exercised by the Licensing Committee. the Foreign Investment Board,

the Capital Goods Committee, the Technical Development Fund Committee, the Committee on Joint Ventures abroad and the Import Licensing Committees within the jurisdiction of the CCI&E (para 5.8).

<b>Delicensing of investments upto Rs. 10 crores</b>	(5) The present investment limit for delicensing be raised from Rs 3 crores to Rs 10 crores for the electronics industry so as to effectively delicense it, without any of the existing pre-conditions on limits for import of raw materials and components or locational aspects. The exception in regard to MRTP/FERA companies and reservation of certain areas for the small scale sector, as of now, may be retained, in consonance with the accepted socio-economic policy frame (para 5.4).
<b>Nodal agency</b>	(6) The existing and new units in the proposed delicensed area need, only register the details of their activities with a single nodal agency, viz, the Department of Electronics except for small scale units where such an agency may be the State Director of Industries or the District Industries Centre (para 5.6).
<b>Time bound clearance</b>	(7) The Department of Electronics shall act as the Secretariat for the Board and accept the responsibility for time-bound package clearance of all applications within a maximum period of 45 days (para 5.9).
<b>Single point clearance</b>	(8) (a) The applications for import of raw materials, components and tooling for electronics industry be disposed of by the Department of Electronics; (b) Formal references to the DGTD by the Department of Electronics on all matters connected with the Electronics industry be dispensed with (para 5.10).
<b>Review of non-viable capacities</b>	(9) In the case of MRTP/FERA companies, all such cases where fragmented and non-viable capacities have been sanctioned in the past should be reviewed urgently by the Department of Electronics and firm proposals submitted to the Electronics Approval Board to rectify the situation (para 5.11).
<b>Positive approach to foreign collaboration</b>	(10) There is clearly need for liberalising induction of foreign technology in the components field (para 4.6).  (11) There need be only a list of banned items/processes for foreign collaboration, for clearly stated reasons, leaving the entire residual area free for foreign collaboration. Full authority be vested in the Electronics Approval Board

to examine and sanction proposals for foreign collaboration, as well as equity participation, even if this involves some departures from the existing guidelines keeping the specific requirements of the electronics industry in view, but not at the cost of national interest (para 5.15).

**Production of telecommunication equipment also in private sector**

- (12) The private sector could supplement and augment production in the public sector of telecommunication equipment substantially; restriction on it be selectively removed and consequential changes made in the industrial Policy Resolution (para 5.13).

**Automatic allocation of frequencies to manufacturers**

- (13) In the case of telecommunication equipment, the Department of Electronics, in consultation with the Ministry of Communications, where necessary, should ensure that allocation of frequencies (only for manufacture and not operation) is done more or less automatically and does not tantamount to licensing, for the delicensed sector (para 5.14).

**Effective reservation for small scale sector**

- (14) The list of items reserved for the small scale sector be comprehensively reviewed annually (para 5.12).

**Activity reservation for small scale sector**

- (15) Consumer electronics, assembly of test and measuring instruments and simple control and micro-computer systems are some of the areas suited to the small scale sector; in these areas therefore the policy of the Government would need to be implemented through reservation of assembly activities for small scale sector and through ancillarisation. In addition to reserving production of some items for the small scale sector and the benefit of fiscal concessions being given only to this sector, some assembly activities should also be exclusively earmarked for this sector. Any further expansion of capacity in the area of consumer electronics in the organised sector should be subject to the stipulation that assembly operations would be confined to the small scale and ancillary units only. The organised sector should promote the small scale and ancillary units, through progressive quantitative increase in their turnover coming from such units (para 9.5).

**Mutual dependency**

- (16) Effective implementation of the existing policy requires more dynamic measures and not merely static reservation of products for small scale sector or denial of opportunities for growth to the organised sector. The real growth of the small scale and tiny sectors of industry has to complement the growth of the organised sector utilising contemporary

technology with mutual concern for each other's interest. The organised sector must be made to accept the responsibility for providing essential inputs to the small scale units and ancillaries in matters of technology, marketing after sales follow up and making available raw materials and components; the State Electronics Development Corporations must also be made to play a much more effective role in this direction. To enable manufacture of electronic products for various types of applications in the short run a deliberate policy of liberal imports, extension of technology, training and professionally managed common facilities for the small scale sector is needed (paras 9.6 and 9.7).

### **Imports & Tariffs**

#### **Rationalised import policy**

- (17) (i) Import of fully assembled and ready-to-use electronic equipment, excluding test equipment, be restricted, except in certain specified cases where the domestic requirements do not justify the setting up of fabricating capacity or assembly units;
- (ii) capital goods not available indigenously be placed on Open General Licence, as far as possible;
- (iii) test equipment, tooling, components, professional grade in particular, and raw materials be also placed on Open General Licence except those which are being manufactured in the country in the short-term and warrant protection in the national interest; the import of the latter however being restricted;
- (iv) items on restricted list be eligible for automatic licensing at 110% of previous year's consumption of imported items by value, at 150% for small scale sector for components and supplementary licensing, subject to the prescribed scrutiny (the Department of Electronics shall act as the nodal agency for this purpose).
- (v) wherever feasible, pack values be fixed for import as percentages of the ex-factory price of the end-product, laid down from year to year, to regulate automatically the import content;
- (vi) no restriction be placed on the import of second hand plant and testing equipment except to the extent of the usual certification about the good condition, residual life and depreciated value of the equipment from a chartered engineer (para 6.4).

#### **No canalisation**

- (18) There is no need for any canalisation of imports (para 6.12).

**No advertisement procedure for capital goods**

- (19) For capital equipment of the electronics industry advertisement procedure may be dispensed with (para 6.7).

**Rationalised import duty structure**

- (20) The irrationality in Customs duty structure is a deterrent to the development of the electronics industry in the country. This situation therefore needs to be rectified immediately (para 6.9).

- (21) (a) Capital goods, test equipment, tooling, raw materials and components placed on Open General Licence be wholly exempted from duty:

(b) items, not placed on OGL be assessed to duty at 100% ad valorem except for specified items which may need higher duty protection because of their nascent development or for any other reason, depending on cost studies and in the national interest; however, the industry should be put on notice that tariff protection would be gradually reduced so that they might take steps to reduce their cost of production and build up their competitive strength in a definite time frame, of say 3/5 years, the protective duty structure being subject to periodic reviews (para 6.10).

**Set off against multiple taxation**

- (22) A fixed set-off, worked out on an empirical basis, be given to reduce the cascading effect of multiple taxation. The existing area or quantum of central excise duties on electronics goods should not be enlarged for three years (para 6.13).

**Stable import/tariff policy**

- (23) The import/tariff policies formulated should have a stable tenure of at least three years (para 6.14).

#### **Fiscal and Financial Measures**

**Priority status for Electronics and benefits thereof**

- (24) The electronics industry (other than the consumer sub-sector) and more especially the electronics components industry should be regarded as a priority industry and this should get reflected in the relevant acts, rules regulations and guidelines. Based on its priority status, the benefits which are available to various priority industries under the various acts, rules and regulations should be extended also to the electronics industry (excluding the consumer goods area) and especially to the electronics components industry (para 7.3).

**Higher rate of depreciation**

- (25) The rate of depreciation for electronics components industry be fixed at 20% under the Income-tax Act (para 7.5).

**Partial tax holiday for components industry**

- (26) The partial tax holiday incentive be continued for investments in new, electronics components industries for the next five years since the components industry holds the key to development of electronics industry but has been a late starter in India (para 7.7).

**Fruitful interaction with financial institutions by Department of Electronics**

- (27) The Department of Electronics should interact with the financial institutions and arrange for imparting training to entrepreneurs, who need it, in project formulation and help the financial institutions by supplying them panel of independent experts for project appraisal in the sophisticated field of electronics (para 7.9).

**No recurring Broadcast Receiver Licence (BRL) fee on radio sets**

- (28) The basis for raising revenue year after year by relating it to possession of a radio set in fast getting out of date, taking into account the technological advances, size, of radio sets, their portability, extent of piracy on use of unlicensed sets, and less than 50% efficiency in levy and collection of BRL fees even after 3 years of sale. The basis for raising revenue should in future be a one time levy on a graded ad valorem basis roughly equal to the present average life time revenue received through BRL on the sets, cheap sets of value upto Rs. 165 being exempted from even the one time levy (para 7.11).

### **Exports**

**Export Zone (SEEPZ) facilities to be comparable internationally**

- (29) The Export Zone cannot really take off unless it offers facilities which are at least on par with those offered by other similar zones in the neighbouring countries (para 8.11).

**Full authority to Development Commissioner of Export Zone**

- (30) The Development Commissioner Export Processing Zone should be fully authorised to take and communicate decisions on all matters including Central customs/excise questions. The status of the Development Commissioner should be such as to enable him to effectively discharge these functions. The SEEPZ Board should be abolished and its duties and powers handed over to the Development Commissioner SEEPZ (para 8.13).

**Concessions essential to revive export zone**

- (31) (a) Exemption from corporate tax and tax on dividends for SEEPZ units, existing and to be newly set up for a period of five years with an inbuilt provision to review the question of tax holiday for a further period on the merits of each case at the end of the five years.

(b) a higher rate of depreciation for Zonal units, which should at least be 30% every year.

(c) abolition of the service charge levied by SEEPZ Administration.

(d) an ad hoc but appropriate percentage of export value to be allowed as compensation towards Central Sales-tax, State Sales-tax; Octroi, Electricity Duty etc, be worked out by the Development Commissioner in the case of each unit and allowed under the Market Development Fund which is in fact meant to remove such disincentives of export (para 8.14).

**Single point  
approval for  
export Joint  
ventures**

- (32) Proposals for joint ventures abroad from Indian entrepreneurs in the field of electronics be henceforth received and cleared by the Electronics Approval Board; keeping in view the paramount need to have an integrated organisational approach to the growth of the electronics industry which differs from other industries in many respects (para 8.17).

**Reasonable and  
simple incentives  
to promote exports  
from hinterland**

- (33) (a) A rate of 20% cash support to electronics exports would be appropriate and the rate should remain unchanged for at least three years;

(b) drawback rates be empirically fixed on the basis of a percentage to be applied to the f.o.b. value of exports, if necessary, in three or four distinct groups of related equipment and components taking into account the likely incidence of customs and Central excise duties entering into products covered by each group;

(c) a simple application from the exporting units of what they require by way of duty-free imports, supported by a chartered agency's certificate, should be adequate for granting the duty exemption; in case of misuse or non-performance, penal duties may be levied. The facility should be extended to programmed but committed exports, without insistence on firm orders, subject of course, to the usual bonds/bank guarantees;

(d) replenishment rates would be necessary and need to be rationalised to facilitate import of new generations of components, designs and prototypes for product development, special toolings and drawings. Adequate flexibility should also be given to the exporting units in their shopping lists taking into account the fact that there are rapid changes in the circuitry designs;

(e) liberal grants be given from the Market Development Fund not only to approved organisations and eligible



merchandising Export Houses but also to individual units with an export performance and potential of over Rs. 10 lakhs and Rs. 1 crore per annum respectively;

(f) electronics export items other than those which require mere assembly activity with indigenously available components should also be eligible for the more liberal packing credit terms (para 8.19)

**Export quality  
assurance**

- (34) There is need for facilities available in the field of electronics in the country being pooled and coordinated for effective quality assurance services to the exporting units as well as to their foreign customers. Export promotion organisations in the field should assist exporting units by making available to latter at little or no cost, codified reprints of standards, including English translations, on request (para 8.20).

**Export  
Promotion  
Council**

- (35) For a concentrated export drive in electronics, which offers tremendous scope, there should be a distinct and separate Export Promotion Council consisting inter alia of representatives of the Ministry of Commerce and the Department of Electronics. The administrative jurisdiction of this Export Promotion Council should properly vest with the Department of Electronics which should have the overall and integrated responsibility for growth in electronics which needs to be stimulated also by exports (para 8.21)

**Research, Development and Manpower**

**R & D  
a must  
for  
industries**

- (36) The industries in the private sector, especially those in the organised sector, be persuaded to develop inhouse R & D capability which should not merely be for the purpose of obtaining fiscal reliefs but essentially for the development of indigenous technology and for adaptation and updating of the imported technology. Within the proposed framework of industrial licensing of MRTP and FERA companies and new units with an investment of more than Rs. 10 crores, and taking into account the present policy on the import of technology and foreign collaboration, measures should be taken to ensure that a reasonable percentage of the turnover or profits of the industrial units is expended by them on R & D which is meaningful, relevant and commercially linked with their production. Our Research & Development efforts must be related to the requirements of our industrial production along with a high degree of cost consciousness (para 10.5).

**R & D in  
materials and  
components  
vital**

- (37) A concerted effort in R & D in the area of materials and components technology should be organised by the Department of Electronics. In this effort no resource constraint, financial, material or manpower, should be allowed to come in the way (para 10.6).

**Identified R & D  
to be encouraged  
and promoted**

- (38) The Department of Electronics should continue to fund institutions like the Universities & the Institutes of Technology on well identified projects including long ranging research programmes. This would help to elevate the quality of manpower development in our academic institutions apart from other benefits which are bound to accrue as a result. The existing national research organisations in the areas of electronics should be given all the support so that they continue to grow, preferably in identified areas of specialisation so that there is no duplication of effort with consequent dilution of our scarce resources (para 10.7).

**Direction and  
Coordination  
of R & D by  
Department of  
Electronics-  
Setting up  
of ERDO**

- (39) The Department of Electronics should be entrusted with the responsibility for giving a sense of purposeful direction to and for the coordination of all R & D activities in the country. This should be ensured not merely through the mechanism of funding projects in various institutions but through promoting bilateral organisational linkages between industry and the R & D institutions. To achieve all this, the Committee recommends that an Electronics Research & Development Organisation (ERDO) under the Department of Electronics should be set up (para 10.8).

**Development of  
Manpower**

- (40) It is necessary that much greater attention is given to ensure that our potential engineers and technicians, fresh from the universities and institutes, measure up in quality to the high standards, with the right orientation, required by the electronics industry. This would require development of a suitable strategy and coordinated action between the Department of Electronics, Ministry of Education and the Ministry of Labour. In this we should not lose sight of the requirements of the electronics industry for highly skilled workmen, technicians, and the supervisory personnel. The Department of Electronics should also work out a scheme for the exchange of technical personnel at all levels between the industry and the educational and R & D establishments so that they are aware of each others' specific requirements thereby helping to establish linkages between the two besides providing an avenue for cross-fertilisation of ideas (para 10.9).

## **Quality Management and Standardisation**

### **Systematised Quality Assurance institutions to cover whole of industry**

- (41) The area of standards and quality assurance is very important and should engage the serious attention of Government and industry with a view to setting up institutionalised arrangements covering all production units in electronics. The working of the Test and Development Centres and the four regional centres should be entirely reoriented to the requirements of the industry which should have a considerable say in their planning and management. This should be ensured by the Department of Electronics through the setting up of a suitable standing forum. The ISI and the test centres including the export inspection agencies should coordinate their efforts under the aegis of the Department of Electronics with those of the Electronics Standardisation Sub-Committee of the Ministry of Defence (LSSC) so as to ensure continuous refinement of specifications and procedures for testing, certifying and quality management. Immediate arrangements be introduced for inhouse quality management by major manufacturing units. Inhouse inspection facilities in some of the major manufacturing units may also be recognised for the purpose of their issuing certificates of quality and conformity to specifications in respect of the products of the other units also. Surveillance by authorities and agencies nominated by the Department of Electronics, of the working of such recognised centres in the public and private sectors would also be necessary. The ultimate aim should be to link every manufacturer in the country with a recognised quality assurance centre (para 11.3).

### **Incentives to Quality Consciousness**

- (42) To facilitate the promotion of quality consciousness, 1% rebate on loans from financial institutions should be available to all units whose products are inspected and certified by agencies nominated or recognised by the Department of Electronics. All nationally financed test and inspection centres should make available their facilities free for an initial period of 3 to 5 years purely as a promotional activity with a view to popularise the inspection and certifying procedures among the units manufacturing electronic products (para 11.4).

### **Standardisation and Specifications by consensus**

- (43) The Department of Electronics should organise meets with industry annually, if not at more frequent intervals, to ensure that the national specifications get evolved over a broad spectrum commensurate with the requirements of the industry and without standardisation becoming a dogma.

The Department of Electronics should provide the necessary thrust and leadership in this vital area (para 11.6).

### **Computers**

#### **Need to develop indigenous computer industry**

- (44) Immediate measures are necessary to ensure that indigenous production of contemporary computers and peripherals makes rapid strides so that the range of computer systems produced in the country does not continue to be restricted (para 12.5).

#### **Measures for rapid development**

- (45) The existing organisations and others who are likely to enter the area of minicomputers and microprocessor based systems, for manufacture and sale within the country and those who have gone in for medium sized computers have the capability to satisfy a good proportion of the functional requirements of users within the country. The basic rationale of the policy measures proposed earlier, subject to certain modifications, in respect of industrial approvals including foreign collaboration, import policies, tariff structure, exports, fiscal incentives etc. apply equally to the area of computers including minicomputers and microprocessor based systems, peripherals as well as other related items of equipment and software. These policy measures would impart the necessary dynamism for the rapid development of this sector of the electronics industry where the growth has been somewhat stunted so far and where a very large technological gap exists and needs to be bridged (para 12.9).

#### **Strategy for development**

- (46) Strategy for the development of the computer industry has to give first priority to the mini-computers and microprocessor based systems costing not more than Rs. 50 lakhs with maximum flexibility in the import of components. Second priority has to be for medium computers costing more than Rs 50 lakhs. The large computer systems will naturally have to take the third priority (para 12.10).

#### **Rationalised Tariff Structure**

- (47) (i) All imported computer systems and such sub-systems, peripherals, accessories, software etc as are under production in the country be subject to import duty at 100% ad valorem; in addition, countervailing duty on par with the excise duty levied on indigenous manufacturers should also be imposed;
- (ii) for the present and till the indigenous industry is in a position to market systems of value above Rs. 50 lakhs, which as per present estimate may take 4 to 5 years; import duty on systems of value above Rs. 50 lakhs

inclusive of peripherals, accessories, software etc may continue to be levied at the present rate of 40% ad valorem. The countervailing duty should be reduced to 8% in line with the recommendations made in sub-para (iv) below. However, full rate of duty as in (i) above shall be levied on identifiable discrete units of the above imported systems which are being manufactured in India and already enjoy protective duty;

(iii) all sub-systems, peripherals and accessories which are not being produced in the country should also be subject to an import duty of 40% with a countervailing duty of 8%; and

(iv) excise duty on all indigenous computer systems, sub-systems, peripherals, accessories etc should be reduced from level of 25% to the general rate of 8% (para 12.11).

**Merger of efforts in public sector-Computer Corporation of India**

- (48) The corporate future of the CMC lies in its forging an organic bond with a viable indigenous computer manufacturer which in this case is obviously the ECIL. This can be achieved through the merger of the computer division of ECIL with CMC into a single public sector undertaking to be called the Computer Corporation of India which should be placed under the administrative control of the Department of Electronics. Bold and imaginative corporate plans would need to be drawn up by the Computer Corporation of India so that India attains self-reliance in the whole range of computers as soon as possible (para 12.15).

**Maintenance also by other manufacturers**

- (49) Maintenance of computer systems including peripherals supplied by foreign collaborators of manufacturing units in India should also be permitted to be maintained by manufacturing cum maintenance organisations in India, in addition to the Computer Corporation of India. The choice should be left to the actual user (para 12.16).

**Sound import policy**

- (50) The basis tenets of the present policy on import of computers continue to be valid and do not call for any change (para 12.20).

**Computer Cell in Ministry of Labour for speeding up import decisions**

- (51) For deciding on all aspects of labour interests relating to computers, the Ministry of Labour should constitute a cell in that Ministry manned by persons with knowledge of computer systems, the diversity of its applications and its impact on productivity, labour displacement etc. The cell should work in close consultation with the Department of Electronics so that in the initial stages of the finalisation of

the configuration of computer system this extremely important aspect is fully taken care of (para 12.21).

**Import  
procedure  
too rigid**

- (52) The present procedure for the import of computer systems is much too rigid and cumbersome and tends to defeat the very purpose for which computers are required (para-12.20).

**Rationalised  
import  
procedure**

- (53) Under the rationalised procedure for procurement of imported computers, for systems of value more than Rs 50 lakhs, the user will draw up detailed specifications and systems configuration and they will be critically examined by the Department of Electronics in consultation with the user, the Cell in the Ministry of Labour, where necessary, and the Computer Corporation, the last being essential where maintenance is to be done by the Corporation. If the proposal is found to be justified, the Department of Electronics will clear the computer system for import. Thereafter the user shall float global tenders broadly in the manner prescribed by the Department of Electronics from time to time. The user will get the selected system and the draft contract approved by the Department of Electronics which will consult where necessary, the Computer Corporation so as to ensure that the contract covers purchase of equipment, peripherals, spares, maintenance, warranty etc and the application for import licence will be submitted to the Electronics Approval Board as per normal procedure. Where the c.i.f value of the system does not exceed Rs 50 lakhs approval for import clearance will be obtained from the Department of Electronics without the necessity of having to go through the above procedure, as is being done at present for systems below Rs 5 lakhs in value (para-12.22).

**Monitoring  
of imports  
under  
special  
clearance**

- (54) The policy for the import of computers against an obligation for export of software and the special clearance for such imports may be continued and the use of such computers should be monitored by the Department of Electronics and the results thereof published in the annual reports of the Department (para 12.23.)

**Policy  
on RCCs  
sound**

- (55) The present policy for setting up Regional Computer Centres is basically a sound one and may be continued while adapting it to the changing pattern of user demands; this, of course, has to be a continuous process (para 12.26).

**Centralised  
guidance**

- (56) The transfer of the National Centre for Software Development and Computing Techniques (NCS DCT) to the Depart-

**and  
promotion  
of national  
computer  
effort**

ment of Electronics was a step in the right direction but the follow up action for linking the NCS DCT to the Department of Electronics administratively still remains to be implemented. The NCS DCT be hived off from the Tata Institute of Fundamental Research (TIFR) and set up immediately as an autonomous registered society, administratively linked to the Department of Electronics. A computer advisory panel should be set up in the Department of Electronics directed by the Secretary, Department of Electronics and with a cross section of computer professionals, manufacturers, users, scientists and technologists engaged in research and development, represented on it to guide and promote the national computer effort (para 12.32 and 12.33).

**Review of  
fast changing  
computer area  
after three years**

- (57) The whole area of computer development, maintenance and related issues be subjected to a review after three years in the light of the growth and changes that may take place during the period (para 12.34).

#### **Central Public Sector Undertakings**

**Public sector  
undertakings to  
be linked to  
user ministries**

- (58) To keep up with the frequent changes in user requirements and the associated technology and in order to ensure efficient product support, close and continuous interaction amongst the customer, the production undertaking and the user Ministry has to be maintained. This can only be effectively ensured if the undertakings are administratively linked to the user Ministries concerned (para 13.9).

**CEL to  
progress  
rapidly**

- (59) It is necessary that all possible measures are taken by the Government so that the highly laudable objective for which the Central Electronics Limited was set up are achieved as early as possible (para 13.6).

#### **Organisational Structure**

**Rationalisation  
of  
Organisational  
Structure**

- (60) The organisational structure of the Department should be suitably strengthened so as to enable the Department to discharge its onerous responsibilities fully. It would have to be substantially different from that of the Department of Atomic Energy to subserve its functions (para 14.1, 14.3).

**Electronics  
R&D  
Organisation  
(ERDO)**

- (61) The Committee has recommended the formation of an Electronics Approval Board and an Electronics Research and Development Organisation (ERDO) under the Department of Electronics (para 14.4).

- (62) The head of ERDO should be an eminent electronics engineer or technologist of proven competence and an established reputation; he should be designated as Director General (ERDO) (para 14.5).
- (63) ERDO will have to attract scientists, engineers and technologists of proven merit. The Government should be willing to provide adequate compensation to attract Indians of exceedingly high technological competence presently working abroad. In the ultimate analysis, this approach would give dividends to the nation in the form of technological self-reliance in a highly sophisticated area which will be out of all proportion to the additional expenditure which may be incurred on some individuals. This is a matter of crucial importance in the development of electronics industry in the country (para 14.7).

**R&D  
Board**

- (64) To provide guidance and direction and in order to ensure proper coordination in respect of the R&D activities of ERDO, an R&D Board should be constituted in the Department of Electronics (para 14.8).

**Planning &  
Coordination  
Group**

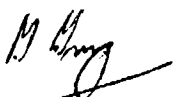
- (65) A planning & Coordination Group under the Department of Electronics should be set up for coordinating the growth and development of the public sector units, producing electronic items and proper utilisation of our meager resources, in areas of high sophistication and high level of investment. This applies also to the units of the Electronics Development Corporations under the State Government. It will facilitate effective coordination with other Ministries/ Departments intimately concerned with the development of the Electronics Industry and also give guidance in respect of work connected with "Joint Commissions" with other countries which in some cases present good prospects for the development of the Electronics industry to the mutual advantage of both the countries (para 14.9).

**Restructuring  
of  
Electronics  
Commission**

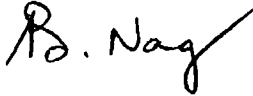
- (66) There is no justification for the Electronics Commission to continue in its present form. Instead, it would be more useful to have a body free from executive functions charged with the responsibility of advising the Government on the development of Electronics in the country as a long term perspective covering the total spectrum. This body should accordingly be named the 'Electronics Development Commission' (para 14.10).
- (67) Separate identity of the existing organisations under the Electronics Commission should be immediately merged in the Department of Electronics (para 14.11).




<b>Personnel Policy</b>	(68) Except for appointments at relatively higher levels, such as heads of divisions, which should be on contract or tenure basis for a fixed period, all other appointments must be on regular basis save in exceptional cases. The scheme for merit promotion and grant of extra increments should also be introduced in the Department of Electronics, where the staff are engaged in activities which are predominantly of research, design and development nature, without any further delay (para 14.13).
<b>Effective financial control system</b>	(69) Consequent on the suggested restructuring of the Electronics Commission, the normal system of financial control existing in other Departments and Ministries of the Government of India should be adopted in the Department of Electronics with an Integrated Financial Adviser at an appropriate level reporting to the Secretary, Department of Electronics and to the Secretary (Expenditure) in the Ministry of Finance as in other Ministries and Departments (para 14.14).
<b>Scrutiny of Government imports</b>	(70) The Department of Electronics should carry out import scrutiny in respect of banned items only in keeping with the practice followed by the DGTD. No further clearance with reference to the value of items above Rs. 5 lakhs is necessary, which is presently done in regard to the restricted items and even items on Open General Licence (para 14.15).
<b>National Radar Council (NRC)</b>	(71) With the setting up of the Electronics Research and Development Organisation (ERDO) recommended earlier, the functions of NRC can be fully discharged by ERDO. There is no need for NRC to continue in its present form (para 14.17).
<b>Defence Project Cell</b>	(72) The activities of the Defence Project Cell in the Department of Electronics should continue in the present form as a part of the ERDO (para 14.18).
<b>Industrial Electronics Promotion Programme (IEPP)</b>	(73) The 'Industrial Electronics Promotion Programme' (IEPP) for the use of control, instrumentation and industrial electronics in major industrial sectors coming under other Ministries/Departments should also in future appropriately become the responsibility of the Electronics Research and Development Organisation (para 14.19).

  
(M. Menezes)

  
(J. A. Dave)

  
(B. Nag)

 29.9.79.  
(M. Sondhi)





सत्यमेव जयते

No. 19(41)(8)/78-Adm.I  
Government of India  
**DEPARTMENT OF ELECTRONICS**  
Vigyan Bhavan Annexe

New Delhi-110011, December 7, 1978

**ORDER**

Prime Minister has directed that a quick review should be undertaken of policies and organisational structures in the Department of Electronics (including the Electronics Commission), so that new directions of policy are identified as early as possible and organisational structures are fashioned to implement the new policies effectively. He has directed that the task of doing this review should be entrusted to a small committee of secretaries consisting of the following :—

1. Shri Mantosh Sondhi,  
Secretary,  
Ministry of Steel & Mines
2. Dr. B. Nag,  
Secretary,  
Department of Electronics
3. Shri J.A. Dave,  
Secretary,  
Ministry of Communication
4. Shri M. Menezes,  
Secretary,  
Defence Production,  
Ministry of Defence

Chairman



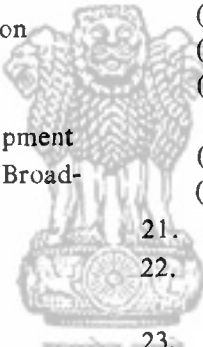
2. The Committee will complete the review and submit a report preferably within 3 months.

3. Shri N. Sivasubramanian, Joint Secretary, Department of Electronics will function as Secretary of the Committee.

Sd/-  
(V. BHATIA)  
UNDER SECRETARY TO THE GOVERNMENT OF INDIA

**Ministries, Departments and Organisations who responded to the  
request of the Review Committee for their views**

**I. Central Government Ministries/  
Departments**

- 
1. Department of Atomic Energy, including
    - (a) Bhabha Atomic Research Centre
    - (b) Electronics Corporation of India Ltd
  2. Department of Chemicals & Fertilisers
  3. Ministry of Communications, including
    - (a) Posts & Telegraphs Department
    - (b) Indian Telephone Industries Ltd
    - (c) Hindustan Teleprinters Ltd
    - (d) Wireless Planning and Coordination Organisation
  4. Ministry of Defence
  5. Department of Defence Production
  6. Ministry of Education
  7. Department of Heavy Industry
  8. Department of Industrial Development
  9. Ministry of Information & Broadcasting, including
    - (a) All India Radio
    - (b) Doordarshan
    - (c) Films Division
  10. Ministry of Labour
  11. Department of Mines, including
    - (a) Hindustan Zinc Ltd
    - (b) Hindustan Copper Ltd
    - (c) Geological Survey of India
    - (d) Indian Bureau of Mines
    - (e) Bharat Aluminium Company Ltd
    - (f) Metallurgical & Engineering Consultants (India) Ltd
  12. Department of Petroleum, including
    - (a) Bharat Petroleum Corporation Ltd
    - (b) Oil India Ltd
    - (c) Oil & Natural Gas Commission
    - (d) Engineers India Ltd
    - (e) Indian Petrochemical Corporation
    - (f) Oil Coordination Committee
  13. Planning Commission
  14. Ministry of Railways
  15. Ministry of Shipping & Transport, including
    - (a) Shipping Corporation of India
    - (b) Department of Light Houses & Light Ships
  16. Department of Space
  17. Department of Statistics
  18. Department of Steel
  19. Ministry of Supply & Rehabilitation
  20. Ministry of Tourism & Civil Aviation, including
    - (a) Civil Aviation Department
    - (b) India Meteorological Department
    - (c) Department of Tourism
    - (d) International Airports Authority of India
    - (e) Air India
    - (f) Indian Institute of Astrophysics
  21. Scientific Adviser to Minister of Defence
  22. Director General, Bureau of Public Enterprises
  23. University Grants Commission
  24. Development Commissioner, Santa Cruz Electronics Export Processing Zone, Ministry of Commerce

**II. Public Sector Undertakings - Central**

1. Bharat Dynamics Ltd
2. Bharat Electronics Ltd
3. Bharat Heavy Electricals Ltd
4. Central Electronics Ltd
5. Electronics Corporation of India Ltd
6. Engineers India Ltd
7. Hindustan Aeronautics Ltd
8. Hindustan Teleprinters Ltd
9. Indian Telephone Industries
10. Instrumentation Ltd, Kota
11. Metallurgical & Engineering Consultants (India) Ltd

12. The Mica Trading Corporation of India Ltd.
13. National Hydroelectric Power Corporation Ltd
14. National Instruments Ltd
15. National Research Development Corporation of India
16. National Thermal Power: Corporation Ltd
17. Oil & Natural Gas Commission
18. Telecommunication Consultants India Ltd

### III. State Governments

1. Government of Andhra Pradesh
2. Government of Assam
3. Government of Bihar
4. Government of Gujarat
5. Government of Haryana
6. Government of Jammu & Kashmir
7. Government of Karnataka
8. Government of Kerala
9. Government of Madhya Pradesh
10. Government of Maharashtra
11. Government of Manipur
12. Government of Meghalaya
13. Government of Nagaland
13. Government of Punjab
15. Government of Rajasthan
16. Government of Sikkim
17. Government of Tamil Nadu
18. Government of Tripura
19. Government of Uttar Pradesh
20. Government of West Bangal.

### IV. Public Sector Undertakings-States & Union Territories

1. Andhra Pradesh Industrial Development Corporation
2. Andhra Pradesh Small Scale Industrial Development Corporation Ltd
3. Assam Industrial Development Corporation
4. Gujarat Communications & Electronics Ltd
5. Himachal Pradesh Mineral & Industrial Development Corporation Ltd

6. Jammu & Kashmir State Industries Development Corporation
7. Karnataka State Electronics Development Corporation
8. Kerala State Electronics Development Corporation Ltd.
9. Maharashtra Electronics Corporation Ltd.
10. Industrial Promotion & Investment Corporation of Orissa Ltd
11. Punjab State Electronics Development & Production Corporation Ltd
12. Punjab Semiconductor Devices
13. The Punjab State Industrial Development Corporation
14. Rajasthan State Industrial & Mineral Development Corporation Ltd.
15. Uttar Pradesh Electronics Corporation Ltd
16. West Bengal Electronics Industry Development Corporation Ltd
17. Economic Development Corporation of Goa, Daman & Diu Ltd

### V. Associations of Industries

1. All India Instrument Manufacturers & Dealers Association
2. All India Manufacturers' Organisation
3. All India Radio & Electronics Association.
4. Associated Chamber of Commerce & Industry of India
5. Association of Indian Engineering Industries
6. Bombay Chamber of Commerce & Industry.
7. Electronics Component Industries Association
8. Electronics Industries Association
9. Engineering Export Promotion Council
10. Federation of Indian Chambers of Commerce & Industry
11. Indian Electrical & Manufacturers' Association
12. Indian T.V. Manufacturers Association
13. Professional Electronics Equipments & Instruments Manufacturers Association


14. The Radio Electronics & Television Manufacturers Association
15. Santacruz Electronics Export Manufacturers Association

#### **VI. Research & Development Organisations**

1. Advani-Oerlikon Ltd
2. Amphetronix Ltd
3. Banaras Hindu University, Department of Electronics Engineering, Institute of Technology
4. Bharat Dynamics Ltd
5. Central Electronics Engineering Research Institute
6. Central Electrochemical Research Institute
7. Central Electronics Ltd
8. Central Mine Planning & Design Institute Ltd
9. Central Mining Research Station
10. Central Salt & Marine Chemicals Research Institute
11. Central Scientific Instruments Organisation, Electronics Division
12. Director General of Civil Aviation
13. Defence Research & Development Laboratory
14. Electro-Mechanical Switches (India) Pvt Ltd.
15. Gujarat Communications & Electronics Ltd
16. Hindustan Aeronautics Ltd
17. Hindustan Teleprinters Ltd
18. Indian Institute of Technology, Bombay, Department of Electrical Engineering
19. Indian Institute of Technology, Delhi, Department of Electrical Engineering
20. Indian Institute of Technology, Kanpur
21. Indian Institute of Technology, Kharagpur, Department of Electronics & Electrical Communication Engineering
22. Indian Institute of Technology, Madras
23. Instrument Research & Development Establishment, Defence Research & Development Organisation
24. Indian Institute of Science, Bangalore
25. Indian School of Mines
26. Indian Telephone Industries Ltd
27. Khadi & Village Industries Commission
28. Larsen & Toubro Ltd
29. Department of Light Houses & Light Ships
30. National Aeronautical Laboratory
31. National Geophysical Research Institute
32. National Metallurgical Laboratory
33. National Remote Sensing Agency
34. Overseas Communication Services
35. Punjab Wireless Systems Ltd
36. Raman Research Institute
37. Solidstate Physics Laboratory
38. System Research Institute
39. Tata Institute of Fundamental Research and National Centre for Software Development & Computing Techniques
40. U.P. Electronics Corporation Ltd
41. Visvesvarayya Industrial & Technological Museum
42. West Bengal Electronics Industry Development Corporation

### Organisations and individuals who interacted with the Committee

#### I. Industries

- 
1. Alpha Electro, Delhi
  2. Associated Electronic & Electrical Industries (Bangalore) Pvt. Ltd., Bangalore
  3. Aurora Model Manufacturing Co (P) Ltd., Calcutta
  4. Concord Electronic Industries, Delhi
  5. DCM Data Products, Delhi
  6. EMCO, Bombay
  7. Ericsson India Ltd., New Delhi
  8. Hegde & Golay Ltd., Bangalore
  9. Hindustan Computers Ltd., New Delhi
  10. Industrial Electronics, Delhi
  11. Intronix (Delhi) Pvt Ltd., New Delhi
  12. Klar Engineering Private Ltd., Bangalore
  13. Konarak TV, Orissa
  14. Mimec (India) Private Ltd., Bangalore
  15. Monica Electronics Pvt Ltd., New Delhi
  16. Morris Electronics Ltd., Bombay
  17. Nippon Electronics Pvt Ltd., Bangalore
  18. O/E/N India Ltd., Cochin
  19. Philips India Ltd., Bombay
  20. Radio Crafts, Bangalore
  21. Santosh Radio Products, Calcutta
  22. Stimuli Electronic Stimulator, Bangalore
  23. Tata Consultancy Services, Bombay
  24. Tummala Electronics Pvt Ltd., Bangalore
  25. UPTRON Powertronics Ltd., New Delhi
  12. Shri C.P. Joshi
  13. Shri K.K. Kandelwal
  14. Shri V.P. Luthra
  15. Brig P. Madan
  16. Shri Madan Mohan
  17. Shri B.N. Makhija
  18. Dr. S.K. Mangal
  19. Shri K.C. Mehra
  20. Prof. M.G.K. Menon
  21. Shri Minu Mody
  22. Shri V. Mohan
  23. Shri K.S.R. Murthy
  24. Shri K.P.P. Nambiar
  25. Shri S. Padmanabhan
  26. Shri A. Parthasarathi
  27. Dr. P.K. Patwardhan
  28. Shri Prabhu Deodhar
  29. Shri Prakash Vaidya
  30. Lt. Col. B.K. Rai
  31. Shri Ramachandra Rao
  32. Dr. R. Ramanna
  33. Dr. E.V.R. Rao
  34. Shri M.R.S.N. Rao
  35. Prof. S. Sampath
  36. Lt. Col. D.N. Sastri
  37. Shri M.M. Sen
  38. Cdr. P.R. Sen
  39. Brig B.J. Shahaney
  40. Wg. Cdr. H.K. Singh
  41. Dr. S. Srikantan
  42. Shri C.G. Subramanyan
  43. Shri C.R. Subramanian
  44. Shri T.R. Subramanian
  45. Shri A.K. Sud
  46. Shri M.M. Suri
  47. Shri A. Swarup
  48. Shri Tarun Das
  49. Shri K.N. Tiwari
  50. Prof. B.M. Udgaonkar
  51. Shri S.T. Vachani
  52. Dr. Ram K. Vepa
  53. Shri S.R. Vijayakar

#### II. Professional Societies & Individuals

1. Computer Society of India
2. Institution of Electronics & Telecommunication Engineers
3. Institution of Engineers (India)
4. Scientific & Technical Officers Association  
Department of Electronics
5. Shri B.N. Ahuja
6. Shri Rahul Bajaj
7. Shri R.K. Baliga
8. Shri P.A. Bhat
9. Shri D.K. Bhattacharya
10. Dr. P.P. Gupta
11. Shri Gurpreet Singh



## Growth of production of electronics in India

(Rs in Crores)

Year	Total production at current prices	Total production at constant prices	Annual growth rate percentage at cur- rent prices	Annual growth rate percentage at const- tant prices
1961-62	15.1	27.35		
1962-63	21.0	36.65	39.07	30.35
1963-64	29.5	48.44	40.48	32.17
1964-65	39.1	57.91	32.54	19.55
1965-66	54.8	75.10	40.15	29.68
1966-67	76.1	91.87	38.87	22.25
1967-68	98.8	106.93	29.83	16.39
1968-69	123.6	135.38	25.10	26.60
1969-70	152.8	161.18	23.62	19.05
1970-71	196.0	196.00	28.27	21.60
1971-72	180.0	170.45	(-) 8.16	(-) 13.03
1972-73	206.0	177.28	14.44	4.00
1973	228.0	173.25	10.68	(-) 2.26
1974	301.0	177.89	32.02	2.67
1975	364.0	207.05	20.93	14.08
1976	410.0	237.82	12.64	14.86
1977	508.0	274.00	23.90	15.21
1978	590.0	319.09	16.14	16.45

Constant price figures are to 1970-71 base of wholesale price index.

**Growth of production of electronics in India—Telecommunication Sector**

(Rs in Crores)

Year	Total production	Production—Telecom- munication Sector		Percentage to total production in electronics	Annual rate of growth (percentage)	
		at current prices	at constant prices		at current prices	at constant prices
1961-62	15.1	5.6	10.14	37.08		
1962-63	21.0	7.7	13.44	36.67	37.50	32.54
1963-64	29.5	9.3	15.27	31.52	20.78	13.62
1964-65	39.1	11.6	17.19	29.67	24.73	12.57
1965-66	54.8	14.2	19.53	25.91	22.41	13.61
1966-67	76.1	19.8	23.91	26.02	39.44	22.43
1967-68	98.8	23.8	25.76	24.09	20.20	7.74
1968-69	123.6	27.6	30.23	22.23	15.97	17.35
1969-70	152.8	28.3	29.85	18.52	2.54	(-) 1.26
1970-71	196.0	35.0	35.00	17.86	23.67	17.25
1971-72	180.0	42.0	39.77	23.33	20.00	13.63
1972-73	206.0	49.0	42.17	23.79	16.67	6.03
1973	228.0	58.0	44.07	25.44	18.37	4.50
1974	301.0	70.0	41.37	23.26	20.69	(-) 6.13
1975	364.0	97.0	55.33	26.65	38.57	33.74
1976	410.0	110.0	63.81	26.83	13.40	15.33
1977	508.0	126.0	67.90	24.80	14.55	6.41
1978	590.0	126.0	69.14	21.35	nil	0.35

Constant price figures are to 1970-71 base.

**Production of Telecommunication Equipment and Licensed Capacity**

Items	Licensed Capacity	Production		
		1975	1976	1977
Teleprinters (Nos)	85.00	5177 (60.9%)	6750 (79.4%)	5500 (64.7%)
Telephones (Million Nos)	0.85	0.364 (42.8%)	0.424 (49.9%)	0.420 (49.4%)
Strowger Exchange Line Equipment (Million Lines)	0.40*	0.140 (56.0%)	0.138 (55.2%)	0.150 (60.0%)
Crossbar Exchange Line Equipment (Million Lines)	0.102	0.112 (110%)	0.093 (91.2%)	0.110 (107.8%)
Electronic Exchange Line Equipment (Line Nos.)	17500	—	100	3000
Transmission Equipment (Rs. Million)	135**	200.3	256.1	260.0
Wireless Communication Equipment (Rs. Million)	600	326.8 (54.3%)	373.2 (62.2%)	400.0 (66.7%)
Transreceivers	+11800			

\* Installed capacity is 0.25 million lines

\*\*At 1971-72 prices, while other figures at current prices

Figures within brackets indicate capacity utilisation

## Number of manufacturers, types and quantities of peripherals licensed

Peripheral type	Licence issued for (approx)	No. of units licensed	Approx. unit cost in rupees	Capacity licensed to each
1. Line printers	850+(100)	6	60,000	50/100/500 (one unit in small scale for 50)
2. Teletype terminals	500+(100)	5	15,000	
3. Paper tape reader and punch	200	1	9,000	
4. Card Reader	650	5	30,000	50/100/300 (one unit in small scale for 50)
5. Magnetic tape drive	600	4	67,500	100/200 (one unit in small scale for 100)
6. Magnetic disc drive	2000+(150)	2	71,250	one unit in small scale for 2000
7. CRT display (including data preparation and direct entry equipment)	1410+(3805)	12	20,000	5/50/100 (small scale 70)
8. Cassette/cartridge drive	3740+(600)	9	8,500	40/100 (in small scale 3200)
9. Floppy disc	350+(400)	6	8,000	50/100 (one unit in small scale for 50)

+ ( ) indicates 5% of capacity of a wholly exporting licensee.

**Growth of production of electronics in India—Instruments,  
Computers and Controls Sector**

Year	Total production				(Rs in crores)	
		Production— Instruments, Computers & Control Sector at current prices	at cons- tant prices	Percentage to total production in electronics	Annual rate of growth (percentage) at current prices	at constant prices
1961-62	15.1					
1962-63	21.0					
1963-64	29.5					
1964-65	39.1	0.8	0.89	2.04		
1965-66	54.8	3.5	4.95	6.39	337.50	45.62
1966-67	76.1	6.1	7.37	8.02	74.28	46.87
1967-68	98.8	8.2	6.71	8.35	34.43	(-) 8.95
1968-69	123.6	11.0	12.05	8.90	34.15	79.58
1969-70	152.8	12.0	12.66	7.85	9.09	5.06
1970-71	196.0	20.0	20.00	10.20	66.67	50.08
1971-72	180.0	14.0	13.26	7.78	(-) 30.00	(-) 33.70
1972-73	206.0	18.0	15.49	8.74	28.57	17.82
1973	228.0	22.0	16.72	9.65	22.22	7.94
1974	301.0	34.0	20.09	11.30	54.55	20.12
1975	364.0	59.0	33.56	16.20	73.53	67.05
1976	410.0	64.0	37.12	15.60	8.47	10.61
1977	508.0	103.0	55.55	20.27	60.94	52.56
1978	590.0	119.0	64.35	20.17	15.53	15.84

Constant price figures are to 1970-71 base.

**Growth of production of electronics in India—Consumer Electronics and  
Mass Communication Sector**

(Rs in crores)

Year	Total production	Production — Consumer Electronics & Mass Communication Sector at current prices    at constant prices		Percentage to total production in Electronics	Annual rate of growth (percentage) at current prices    at constant prices	
1961-62	15.1	7.0	12.68	46.36		
1962-63	21.0	10.0	17.45	47.62	42.86	37.61
1963-64	29.5	13.0	21.34	44.07	30.00	22.29
1964-65	39.1	17.0	25.19	43.47	30.77	18.04
1965-66	54.8	24.0	33.01	43.79	41.18	31.04
1966-67	76.1	32.0	38.65	42.04	33.33	17.08
1967-68	98.8	40.0	43.29	40.49	25.00	12.01
1968-69	123.6	48.0	52.57	38.83	20.00	21.43
1969-70	152.8	65.0	68.57	42.54	35.42	30.43
1970-71	196.0	80.0	80.00	40.82	23.08	21.04
1971-72	180.0	55.0	52.08	30.55	(-) 31.25	(-) 53.61
1972-73	206.0	65.0	55.94	31.55	18.18	7.41
1973	228.0	64.0	48.63	28.07	(-) 1.54	(-) 13.06
1974	301.0	78.0	46.09	25.91	21.87	(-) 5.22
1975	364.0	84.0	47.72	23.08	7.69	3.54
1976	410.0	103.0	59.74	25.12	22.62	25.19
1977	508.0	130.0	70.12	25.59	26.21	17.38
1978	590.0	159.0	85.99	26.95	22.30	22.63

Constant price figures are to 1970-71 base.

## Itemwise production of major consumer electronics items

Items	Production in					
	1972	1974	1975	1976	1977	1978
Radio Receivers (Million Nos)	3.02 (1.04)	3.46 (1.40)	2.52 (1.00)	2.98 (1.30)	3.76 (2.00)	4.42 (2.50)
T.V. Receivers (Thousand Nos.)	39.0 (25.0)	75.7 (49.5)	96.9 (53.4)	143.5 (101.7)	238.8 (178.3)	270.0 (208.0)
Tape Recorders (Thousand Nos.)	36.0 (36.0)	35.1 (35.0)	50.3 (45.0)	70.0 (50.0)	112.8 (71.0)	151.0
Record Players (Thousand Nos.)	88.0 (2.0)	127.9 (17.0)	138.2 (25.0)	119.1 (30.0)	128.5 (35.0)	131.0
Amplifiers & PA Systems (Thousand Nos.)	83.7 (80.0)	107.5 (100.0)	119.0 (115.0)	138.9 (135.0)	142.6 (135.0)	148.0
Calculators (Thousand Nos.)		9.4 (6.0)	20.3 (10.0)	46.9 (22.0)	75.6 (46.0)	150.0

**Remarks**

Some figures for Radio Receivers available for earlier years are given below in Million Nos.

1964-65	—	0.82 ( 0.31 )
1965-66	—	0.99 ( 0.39 )
1966-67	—	1.21 ( 0.45 )
1967-68	—	1.60 ( 0.75 )
1968-69	—	2.36 ( 0.90 )
1970	—	2.67 ( 0.90 )
1971	—	3.02 ( 1.04 )
1972	—	3.02 ( 1.04 )
1973	—	2.62 ( 1.00 )

Figures in brackets refer to small scale sector's production.

**Growth of production of electronics in India—Components Sector**

(Rs in crores)

Year	Total production	Production—Components Sector		Percentage to total production	Annual rate of growth (percentage)	
		at current prices	at constant prices		at current prices	at constant prices
1961-62	15.1	0.5	0.91	3.31		
1962-63	21.0	1.0	1.74	4.76	100.00	91.21
1963-64	29.5	2.0	3.28	6.78	100.00	88.51
1964-65	39.1	4.0	5.93	10.23	100.00	80.79
1965-66	54.8	6.5	8.94	11.86	62.50	50.76
1966-67	76.1	10.0	12.08	13.14	53.85	35.12
1967-68	98.8	15.0	16.23	15.18	50.00	34.35
1968-69	123.6	21.0	23.00	16.99	40.00	41.72
1969-70	152.8	28.0	29.54	18.32	33.33	28.43
1970-71	196.0	37.0	37.00	18.88	32.14	25.25
1971-72	180.0	41.0	38.83	22.78	10.81	4.95
1972-73	206.0	44.0	37.87	21.36	7.32	(-) 2.47
1973	228.0	51.0	38.75	22.37	15.91	2.32
1974	301.0	72.0	42.55	23.92	41.17	9.81
1975	364.0	75.0	42.66	20.60	4.16	0.26
1976	410.0	80.0	46.40	19.51	6.67	8.77
1977	508.0	90.5	48.78	17.82	13.12	5.13
1978	590.0	117.0	63.27	19.83	29.28	29.71

Constant price figures are to 1970-71 base of wholesale price index.



## Capacity and production—Electronic components

Sl. No.	Components	** 1971 ***		*1977		Letters of intent capacity *		Small scale approved capacity/production in 1978*		Production in organised sector					Demand projection 1984	
		Licenced capacity	Installed capacity	Licensed capacity	Installed capacity	of intent capacity		approved capacity/production in 1978*		1971	1974	1976	1977	1978		
1	2	3	4	5	6	7	8	9	10	11	12	13	14			
<b>I. Electron Tubes</b>																
1.	Receiving tubes		5.00	10.00	10.00	—	—	5.69	4.974	3.628	3.829	3.950	6.000			
2.	Transmitting tubes (Nos)			36000	18000	10600	—	10870	12000	9400	10407	9,870	25000			
3.	Microwave tubes (Nos)			300	200	50	—	82	200	260	190	255				
4.	TV picture tubes	0.100	0.012	0.420	0.136	0.04	—	0.012	0.062	0.055	0.091	0.142	0.800			
5.	CR tubes (Nos)			10500	2500	4500	2000	1100	2000	700	1162	1,500				
6.	Photo and image intensifier tubes (Nos)			—	—	1500	—	—	—	100	—	—				
7.	X-ray tubes (Nos)			3600	1800	—	—	1155	1128	1321	1311	1,333				
<b>II. Semiconductor Devices</b>																
1.	Transistors & Diodes		45.00 (7.60)	241.3 (111.40)	103.50	137 (100.75)	—	35.96	70.204	52.914	64.74	77.25	206.0			
2.	Integrated circuits	4.0		4.4	0.50	2.31	—	—	0.167	0.272	0.41	0.610	8.2			
3.	Power upwards (30 A) diodes below (30 A)			3.54	1.41	8.3	—	—	0.223	0.884	0.899	1.499	14.2			
4.	SCRs upwards (30 A) below (30 A)			1.10	0.34	1.25	18.5	—	0.084	0.016	0.028	0.041				
<b>III. A) Resistors (fixed)</b>																
1.	Carbon film resistors	200	80.20 (38.40)	233.5 (16.25)	184.0	189.0 (126.25)	76.7/60.0	90.70	211.585	128.318	169.132	167.131	700.0			

1	2	3	4	5	6	7	8	9	10	11	12	13	14
2.	Metal film/metal oxide film	0.5		12.00	6.00	50.000	37.5/0.5		1.034	1.149	0.959	1.200	25.0
3.	Wire-wound	1.35	0.18 (0.18)	2.3	2.2	3 (0.5)	7.5/4.0		1.025	0.798	0.978	0.970	15.0
4.	Thermistors/varistors	2.0	0.8 (0.8)	5.0	2.0	—	4.1		0.768	0.505	0.759	1.090	2.5
B) Resistors (variable)													
1.	Carbon track potentiometer	5.0	3.60 (2.70)	9.13	4.43	4.0	14.2/12.0 (3.0)	4.62	5.307	4.579	5.507	6.718	30.0
2.	Wire-wound potentiometer			0.89 (0.1)	0.24	0.5	2.35/1.0		—	0.15	0.127		5.0
C) Capacitors (fixed)													
1.	Paper	40.0		12.7	12.1	0.6	—	6.64	2.404	1.771	1.42		2.5
2.	Plastic film capacitors	54.0	39.87 (3.84)	122.75 (15.7)	110.45	105.0 (17.2)	43.83/20.0 (0.6)	28.99	40.854	35.734	45.851	51.533	250.0
3.	Electrolytic capacitors	42.0	16.10 (5.87)	63.7 (20.5)	55.0	65.0	41.84/22.0 (3.5)	13.23	16.215	15.104	17.617	25.60	90.0
4.	Tantalum capacitors			12.75 (10.40)	0.40	—	—		0.230	0.410	0.50	0.49	4.0
5.	Ceramic capacitors	60.0	45.00 (14.10)	240.00 (74.25)	79.00	125.0 (56.25)	32.6/2.0 (8.0)	42.26	61.922	47.596	64.24	75.20	250.00
6.	Mica capacitors	60.0	(7.00)	17.40	7.00	—	93.00 (70.00)		0.683	2.262	3.249	2.554	20.0
7.	Mica plate parts			232.0 (200.00)						145.666	185.535	200.50	
D) Capacitors (variable)													
1.	Gang condensers	3.5	2.39 (1.10)	8.09 (2.25)	6.64	1.2	3.2/1.7 (1.5)	1.81	2.585	2.866	3.088	3.275	10.00
2.	Trimmers	34.0	8.14 (7.14)	30.24	10.24	6.0	1.2		7.778	2.733	2.833	2.680	35.0
IV. Other passive components													
1.	TV deflection components			0.08	0.03	—	0.58		—	1.680	—		

1	2	3	4	5	6	7	8	9	10	11	12	13	14
2.	Loudspeakers		1.90 (1.46)	4.29	3.59	2.0 (2.0)	3.7/2.7	2.24	3.212	2.737	3.019	3.150	12.5
3.	Microphones			0.11	0.01	0.56	1.25/0.1			0.0025	0.0026	0.0032	1.2
4.	Crystals		0.14	0.12	0.36	3.12 (1.00)	—	0.20	0.228	0.179	0.192	0.187	2.0
5.	Magnetic heads			0.55	0.375	0.6	0.9/0.2		—	—	—	—	0.7
6.	Cartridges			0.35 (0.12)	0.35	—	0.74/0.1		—	0.075	0.062	0.080	0.30
7.	Stylus			0.30 (0.12)	0.30	—	0.24/0.3		0.014	0.039	0.038	0.003	0.40
8.	Magnetic tapes (MRM)			184	80	410	1.24		52.73	56.00	41.04		620.0
9.	Ferrites, soft (tons)	400.00	150.00 (25.00)	392	280	170	101 (18)	99.77	134.198	150.18	192.564	228.0	600.0
	Hard (tons)	530.00	50.00	800	460	300	211.5 (135)	7.44	210.671	267.913	404.09	466.50	1000.0
10.	Permanent magnets (tons)	421.00		741.0	741.6	23.4		401.00	347.367	224.542	256.00	279.0	400.0
V. Electromechanical components													
1.	Connectors	5.0		5.313 (0.70)	1.21	2.50	2.2 (0.1)		0.395	0.345	0.345	0.275	12.2
2.	Relays (electromagnetic)			0.57	0.225	1.03	1.07		0.162	0.192	0.238	0.295	
3.	Reed Relays & Reed switches	6.00		9.10 (1.80)	2.76	—	2.25 (1.32)		—	0.325	0.697	0.87	2.8
4.	Switches		2.90 (0.85)	6.20	3.38	1.96	0.07/4.9	2.84	2.507	0.957	1.151	1.47	17.5
5.	Printed circuit boards			0.01 (0.005)	0.01	0.015	0.09		(2.482)	(1.723)	(2.7)	(3.646)	
6.	Tape decks			0.12		—	0.25		—	—	—	—	
7.	DC micromotors			0.05		0.01	0.34/0.001 (0.03)		—	—	—	—	

Note : (1) \* Export figures are in brackets.

(2) The quantities are in million numbers, except where otherwise specified.

(3) \*\* includes letter of intent capacity.

(4) \*\*\* figures in brackets give installed capacity in 1966.

**Production of Electronic Components in Organised Sector**  
(figures for small scale sector in brackets)

(Rs. Crores)

Components	1971	1974-75	1975-76	1976-77	1977-78	1978
<b>Electron tubes</b>						
Receiving	2.04	3.34	3.42	3.14	3.40	4.00
Transmitting	0.61	1.29	1.52	1.64	1.84	1.71
TV Picture	0.32	3.96	3.57	2.98	4.05	5.71
Others	0.39	0.84	0.97	1.25	1.34	1.06
Total	3.36	8.53	9.48	9.01	10.63	12.48
<b>Semiconductor Devices</b>						
Transistors & Devices	7.39	13.24	12.36	11.03	13.06	14.78
Integrated Circuits	N.A.	0.45	0.62	0.69	0.86	0.87
Others	N.A.	1.84	2.30	2.56	2.77	3.12
Total	7.39	15.53	15.28	14.28	16.69	18.77
						(0.35)
<b>Resistors</b>						
Carbon Film	0.68	1.55	1.21	1.15	1.35	1.75
Potentiometers	0.74	0.93	0.94	1.18	1.37	2.42
Others		0.28	0.29	0.40	0.44	0.19
Total	1.42	2.76	2.44	2.73	3.16	4.36
(Small Scale)	(0.8)	(1.00)	(1.56)	(1.72)	(1.84)	(2.50)
<b>Capacitors</b>						
Ceramic	0.63	1.02	1.25	1.37	1.52	2.00
Plastic Film	1.05	1.57	1.65	2.02	2.45	3.60
Electrolytic	0.98	1.73	1.72	2.05	2.46	3.96
Others	0.90	2.13	2.45	3.71	4.05	4.74
Total	3.56	6.45	7.07	9.15	10.48	14.50
(Small Scale)	(1.2)	(2.30)	(2.48)	(2.60)	(2.77)	(2.60)

Components	1971	1974-75	1975-76	1976-77	1977-78	1978
<b>Electromechanical</b>						
Connectors	N.A.	1.01	1.11	1.12	1.31	1.27
Relays	N.A.	0.98	1.10	1.20	1.42	1.97
Switches	0.92	1.12	0.94	1.05	1.33	1.52
Total	0.92	3.11	3.15	3.37	4.06	4.76
(Small Scale)	(2.1)	(2.30)	(2.48)	(3.33)	(3.69)	(4.35)
<b>Other Components</b>						
Loudspeakers	1.72 (0.75)	2.75	2.44	2.75	3.10	4.14 (1.60)
Crystals	1.03	1.22	1.30	1.20	1.21	1.13
Hard Ferrite	0.04	0.50	0.56	0.80	1.07	1.22
Soft Ferrite	0.50	0.62	0.51	0.71	0.72	1.09
Permanent Magnet	2.69	2.14	2.04	2.44	3.12	3.69
Miscellaneous Components		2.01	2.19	2.35	2.55	2.85
Total	5.98	9.24	9.04	10.23	11.77	14.12
(Small Scale)	(4.9)	(9.28)	(10.92)	(13.36)	(18.17)	(20.9)
Total Organised Sector	22.63	45.62	46.46	48.77	56.79	68.99
(Total Small Scale)	(9.00)	(15.00)	(18.00)	(21.03)	(26.50)	(30.70)
Unclassified	7.37	12.38	11.54	12.20	8.71	17.31
Total Estimated Production	39.00	73.00	76.00	82.00	92.00	117.00

## Export profile

	(Rs. Crores)						
	1972-73	1973-74	1974-75	1975	1976	1977	1978
1. Consumer Electronics				7.48	6.92	8.25	6.98
2. Computer, Controls & Instrumentation				5.37	3.92	1.75	1.75
3. Communication				1.61	2.33	3.80	2.13
4. Defence and Aerospace				—	4.96	10.97	11.69
5. Components				included in (1) above	4.11	5.49	6.40
6. Computer Software				0.85	2.00	2.50	3.00
7. Others				0.39	0.59		2.07
8. SEEPZ				0.50	2.23	4.11	5.55
	5.92	7.5	9.26	16.20	27.06	36.87	39.57
Total production	206.0	242.0	307.0	364.5	410.0	508.5	590.00
% of exports to production	2.8	3.1	3.0	4.4	6.6	7.2	6.52

## Public sector undertakings - production

(All figures in Rs. crores)

Year	ITI			BEL			ECIL			HTL			IL		
	At current prices	At constant prices*	At current prices	At current prices	At constant prices*	At current prices	At current prices	At constant prices*	At current prices	At current prices	At constant prices*	At current prices	At current prices	At constant prices*	At constant prices*
1961-62	5.65	10.23	2.43	4.40											
1962-63	7.75	13.52	3.03	5.28											
1963-64	9.30	15.27	6.27	10.29											
1964-65	11.14	16.50	7.08	10.48											
1965-66	13.25	18.22	9.26	12.73											
1966-67	17.24	20.82	11.94	14.42											
1967-68	19.84	21.47	15.83	17.13	0.11	0.10				0.50	0.68				
1968-69	21.10	23.11	20.73	22.70	0.33	0.30				1.00	1.20				
1969-70	21.12	22.28	24.11	25.43	0.95	0.90				2.00	2.16				0.32
•1970-71	26.81	26.81	29.40	29.40	2.00	2.00				3.50	3.83				0.65
1972-73	40.50	34.85	40.41	34.77	2.00	2.00				3.70	3.90				2.74
1974-75	61.90	35.39	51.60	29.50	5.93	6.90				3.90	3.90				4.50
1975-76	74.25	42.91	62.18	35.94	11.69	20.45				4.40	3.78				6.62
1976-77	86.71	49.09	66.01	37.37	16.76	29.01				3.80	2.17				4.57
1977-78	88.96	47.88	75.00	40.36	18.33	32.38				5.05	2.91				3.32
1978-79	90.17	48.61	72.87	39.25	18.15	33.73				5.48	3.09				4.26
										5.45	2.83				5.01
										5.27	2.85				5.70

\*to 1970-71 base

Year	HAL/HD		CEL		BDL		ETDC		CMC		SCL	
	At current price	At constant prices*	At current prices	At constant prices*	At current prices	At constant prices*	At current prices	At constant prices*	At current prices	At constant prices*	At current prices	At constant prices*
1961-62												
1962-63												
1963-64												
1964-65												
1965-66												
1966-67												
1967-68	1.00	1.08										
1968-79	2.33	2.55										
1969-70	4.30	4.53										
*1970-71	5.67	5.67										
1972-73	5.90	5.07										
1974-75	8.50	4.86										
1975-76	10.43	6.10	0.04	0.02	3.20	1.27	0.88	0.50				
1976-77	10.29	5.82	0.08	0.04	5.53	1.85	1.79	1.03				
1977-78	11.48	6.19	0.35	0.19	5.44	3.13	6.49	3.67				
1978-79			0.94	0.51		2.93	11.54	6.91	0.70	0.47		
							12.14	6.54	5.47	2.94		

\*to 1970-71 base



### Industrial policy and liberalisation

The Industrial Policy Resolution of Government of India dated 30th April, 1956 classified industries into three categories. The first category of industries included those for which the future development was the exclusive responsibility of the state. The entry under this category of relevance to Electronics was "Telephones and telephone cables, telegraph and wireless apparatus (excluding radio receiving sets)". In the second category are listed industries which will be progressively state-owned and in which the State will generally take the initiative in establishing new undertakings but in which private enterprises will also be expected to supplement the effort of the State. In this second category there is no entry which has an impact on the development of electronics. All the remaining industries belong to the third category i.e. those which are left to the initiative and enterprise of the private sector. The rest of the electronic industries come under this third category.

2. The statutory basis for Industrial Licensing in the country is the Industries (Development & Regulation) Act 1951. The schedule to the Act listing the industries covered by licensing contain the following entries of relevance to electronics;

**5. Electrical Equipment**

- (1) Equipment for generation, transmission & distribution of electricity
- (2) Electrical motors
- (3) Electrical cables and wires
- (4) X-ray equipment
- (5) Electronic equipment
- (6) House-hold appliances

**6. Telecommunications**

- (1) Telephones
- (2) Telegraph equipment
- (3) Wireless communication apparatus
- (4) Radio receivers, including amplifying and public address equipment
- (5) Television sets
- (6) Teleprinters

**13. Commercial, Office and House-hold Equipment**

- (2) Calculating machines

**15. Industrial Instruments**

- (2) Indicating, recording and regulating devices
- (3) Weighing machines

**16. Scientific Instruments**

Scientific instruments

Explanation : Entries under '5. Electrical equipment' and '6. Telecommunications' also include their components, parts and accessories.

3. The pronouncements on Industrial Policy made in February 1973 and the further policy approaches indicated by Government from time to time included the following liberalisation :

(a) Industries of basic, critical and strategic importance for the growth of the economy, which included the following of relevance to electronics, are open to all.

**4. Electrical Equipment**

- (1) Equipment for transmission and distribution of electricity
  - (2) Electrical motors
  - (4) X-ray equipment
  - (5) Electronic components and equipment
10. Industrial instruments : indicating, recording and regulating devices
11. Scientific instruments

(b) However, certain items listed in a schedule were reserved for units in the small scale sector and have been exempted from licensing subject to certain conditions (list for Electronics annexed). Ancillaries have also been exempted from licensing subject to certain conditions.

(c) Undertakings with investment in fixed assets not exceeding Rs. 3 crores, and not requiring

- (i) FE in excess of 10% of turnover or Rs. 25 lakhs whichever is less, for import of annual requirement of raw materials (other than steel and aluminium), and
- (ii) FE in excess of 10% of turnover or Rs. 15 lakhs whichever is less in any year after 3 years of the commencement of production, for the import of parts and components,

have also been exempted from licensing.

(d) Though exemption from licensing have been granted to investments upto Rs. 3 crores, still licensing provisions apply to establishments covered by MRTP and FERA acts and to non-entitled industries in areas reserved for State Sector or small scale or certain specified 'other sectors'. Also undertakings exempted from licensing have to register themselves with the Director General Technical Development (DGTD). Registration provision, does not apply to small scale sector.

(e) Diversification has been allowed into allied areas of activity for machinery industries, by allowing diversification to other items under groups heads

7 (5) passenger cars;

8 Industrial Machinery;

9 Machine tools;

under groups

5(1) & 5(2) of group head Electrical equipment;

under group heads

1(A) (3), (5) & (7) Iron and Steel Castings and forgings, 'flanges, rings, elbows, tees and bends', 'Steel ingots and castings';

under group heads of Non-ferrous Alloys etc and under group heads No. 35(1) & (2) 'Portland cement and Asbestos Cement'.

The diversification is allowed without having to go through usual licensing procedure and at the discretion of the Joint Secretary in the Ministry. This facility is available to undertakings in all sectors, subject to diversification within licensed capacity and non-violation of reservation for small scale sector.

(f) Automatic growth of capacity has been allowed to 15 Engineering industries at 5% per annum upto limit of 25% in a plan period, over and above their authorised capacity. This

is subject to non-violation of reservation for small scale sector and their not drawing upon financial institutions. It is also subject to non-import of additional capital goods and there being no subsisting foreign collaboration. This facility was not allowed automatically to dominant undertakings (those controlling more than 33% of market).

(g) Capacity created on the basis of inhouse R & D is to be allowed as a matter of course, except to MRTP & FERA companies where it will be examined on merits. Where R & D of a National laboratory is used as basic to and not merely peripheral to the proposed capacity for manufacture, such activity will not require licence except in the case of FERA & MRTP companies.

(h) Additional capacities created as a result of replacement and modernisation of equipment were allowed and import of capital goods was allowed subject to no net increase in outgo of FE and non-violation of areas reserved for small scale sector. Joint Secretaries were given power to allow increase in capacity under licence, through acquisition of indigenous capital goods.

(i) All industries were allowed to apply for increase in the licensed capacity related to maximum utilisation of the plant and machinery already installed subject to such conditions as to exports or distribution as appropriate. The facility was also extended to small scale sector.

(j) The benefit of liberalisation of investment procedure for stimulation of production was extended to "Electronic Components and Equipments" along with 28 other industries in October, 1975. Accordingly, entrepreneurs were allowed to utilise installed capacities in excess of licensed capacities. MRTP & FERA companies were however, to apply for such a concession which was to be examined on merits. The facility was not extended to areas reserved for small scale sector.

(k) Liberalisation in procedures have also been announced by Government from time to time in dealing with applications for industrial licensing, import of capital goods and foreign collaboration.

(l) The powers of the Joint Chief Controllers of Imports and Exports for allowing import of capital goods have been increased from Rs 5 lakhs to Rs 10 lakhs. Similarly powers of Capital Goods ad-hoc Committee have been raised from Rs 10 lakhs (Rs 20 lakhs for the Rupee payment area) to Rs 25 lakhs for both convertible currency and rupee payment area sales. All clearances for import of Capital Goods above Rs 25 lakhs have to be considered by the Capital Goods Committee which would decide the source of foreign exchange financing. All clearances below Rs 25 lakhs would be in free foreign exchange or against the credit with the State Financial Corporations and All India Financial Institutions at the option of the applicant.

#### **Annexure**

The following items are reserved for Small Scale Sector (Electronics items)

1. Battery eliminators
2. Wire wound resistors other than professional types
3. T.V. Antenna
4. Radio/Car Radio (low cost upto Rs 250/- each)
5. Electronic Cigarette lighters

6. Invertor and Convertor upto 500 V amps
7. Regulated D.C Power Supplies (upto 0.01% regulation)
8. Digital Clocks
9. T.V. Games
10. T.V. Tuners
11. Radio & T.V Coils
12. Electronic fan regulators
15. Dimmers and Twilight Switches
14. T.V Booster Amplifiers
15. T.V Deflection Components
16. I.F Transformers
17. Air-Trimmers for professional use
18. Assembly of loudspeakers
19. Hearing Aids
20. Electronic flash gun
21. Amplifiers for entertainment and public address system
22. Transistor headers
23. Low cost radio receivers (below Rs 200/-)

With effect from 8th March, 1978 it has been decided that for the following items prior approval of DCSSI and Department of Electronics would not be required and these can directly be registered with State Directors of Industries for the capacities mentioned against each item:—

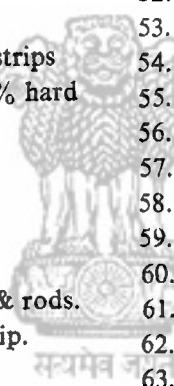
1. Tape Recorder/Telephone Answering Machines, Dictaphone, Car Cassette Players & Combinations thereof with Radio	500 Nos. p.a.
2. Cassettes/Pre-recorded Cassttes	11 lac Nos. p.a.
3. AM/FM Radio	10,000 Nos. p.a.
4. Mono/P.A Amplifiers	2,000 Nos. p.a.
5. Car Radios	2,000 Nos. p.a.
6. Microphones	
(a) for P.A. Systems	2,000 Nos. p.a.
(b) for Tape recorders	30,000 Nos. p.a.
7. Loudspeakers	1 lac Nos. p.a.
8. RF/IFTs & Tuning Coils	5 lac Nos. p.a.
9. T.V booster amplifiers	5,000 Nos. p.a.
10. Hearing aids	5,000 Nos. p.a.
11. Electronic Flash Guns	2,000 Nos. p.a.
12. Wire Wound Resistors	1 lac Nos. p.a.
13. Record Players/Changers	5,000 Nos. p.a.
14. Telescopic Aerials for Transistors & T.V Receivers	1 lac Nos. p.a.
15. Fan Regulators	30,000 Nos. p.a.
16. Light Dimmers	10,000 Nos. p.a.
17. Gas Lighters/Cigarette lighters	50,000 Nos. p.a.
18. Electronic Emergency Lantern	10,000 Nos. p.a.
19. D.C Power Supplies both regulated & otherwise	1,000 Nos. p.a.
20. Battery Eliminators	1,000 Nos. p.a.

## Time taken for Industrial Approvals (including disapprovals)

Categories of case in available sample	Cases Total	Spread of cases according to time taken (in months)										
		0 to 3	4 to 6	7 to 9	10 to 12	13 to 18	19 to 24	25 to 36	37 to 48	49 and above		
1. Industrial Approvals												
1972	18 (8)	—	—	2	3	4	2	3	1	3		
1973	78 (6)	—	10	16	16	22	1	4	5	4		
1974	70 (13)	6	33	9	7	3	2	2	4	4		
1975	33 (9)	13	18	1	—	—	—	1	—	—		
1976	21 (1)	7	7	—	2	3	1	1	—	—		
1977	25	6	9	3	6	—	1	—	—	—		
1978	9	2	6	—	1	—	—	—	—	—		
Total	254	34	83	31	35	32	7	11	10	11		
2. Capital Goods Applications												
1974-75	5 (1)	—	1	2	2	—	—	—	—	—		
1976	9	2	1	1	2	3	—	—	—	—		
1977	16	8	3	3	1	1	—	—	—	—		
1978	18	14	3	1	—	—	—	—	—	—		
Total	48	24	8	7	5	4	—	—	—	—		
3. Foreign Collaboration												
1972	10 (2)	1	—	—	2	4	2	1	—	—		
1973	31 (2)	7	6	6	3	7	1	—	—	1		
1974	26	3	14	5	1	3	—	—	—	—		
1975	4 (1)	1	1	1	—	—	1	—	—	—		
1976	7	5	2	—	—	—	—	—	—	—		
1977	11	2	—	—	9	—	—	—	—	—		
1978	6	—	—	—	6	—	—	—	—	—		
Total	95	19	23	12	21	14	4	1	1	1		

Note : Numbers within brackets indicate approvals not implemented and cancelled.

**Representative List of Raw Materials, Components, Test Instruments etc for  
Electronics Industry not available in India and presently imported**

- 
- |   |  |
|---|--|
| 1. Semiconductor grade poly silicon, single crystal rods and wafers | 39. Capacitor tissue paper.                      |
| 2. Device housings for high power semiconductor devices             | 40. Epoxy based sheet.                           |
| 3. Fe-Ni Alloys   | 41. Potassium cyanide.                           |
| 4. Oxygen free high conductivity copper                             | 42. Stannous sulphate.                           |
| 5. Filler material Cu-Ag alloy                                      | 43. Sodium cyanide                               |
| 6. Ultra High Purity Silver   | 44. Cadmium Oxide.                               |
| 7. Molybdenum discs   | 45. Rota finish compound                         |
| 8. Aluminium-silicon alloy 99/1 foils                               | 46. Teflon spray                                 |
| 9. Aluminium-silicon alloy Eutectic foils                           | 47. Miniature cables                             |
| 10. Liquid and Gaseous diffusion sources for semiconductor industry | 48. Magnus Chlorolube.                           |
| 11. Magnesium Aluminium Alloy Foils                                 | 49. Mould release agent.                         |
| 12. Aluminium Alloys Tubes  | 50. CRCA Steel strips.                           |
| 13. Aluminium 4 to 6% Mag. Alloy strips                             | 51. Stainless steel items.                       |
| 14. Aluminium strip in rolls 1 to 1.5% hard Mn. alloy               | 52. ASS Moulding Powder.                         |
| 15. Dur Aluminium   | 53. Resistance wires.                            |
| 16. Aluminium Sheet/Strips  | 54. Ebonite Sheets/rods/tubes.                   |
| 17. Brass Tubes   | 55. Enamelled copper wires.                      |
| 18. Spring temper brass strips in foils                             | 56. Coaxial feeder cable.                        |
| 19. Nickel Silver Strips/Wires/sheets & rods.                       | 57. Copper clad laminates.                       |
| 20. Nickel chrome resistance wire/strip.                            | 58. Bimetal Strips.                              |
| 21. Nickel silver fuse wire.  | 59. Green Felt.                                  |
| 22. Tinned Brass.   | 60. Styroflax film.                              |
| 23. Nickel based alloy  | 61. Yellow varnished sleeveings.                 |
| 24. Brass Section   | 62. Spun gloss sleeveings.                       |
| 25. Beryllium copper sheets/strip/wires.                            | 63. Photo resist film.                           |
| 26. Copper flux/foils.  | 64. Ployster/stainless steel screen mesh.        |
| 27. Phosphor bronze foils, wires, tubes.                            | 65. Self solderable enamelled copper wires.      |
| 28. Carbon granules.  | 66. Cellulose acetate rolls.                     |
| 29. Carbon rod.   | 67. Rota finish compound.                        |
| 30. Artificial graphite rod.  | 68. Agate Stone Block                            |
| 31. Litz Wire.  | 69. Atimite.                                     |
| 32. Glass cloth.  | 70. Ringing machines, ringing dynamotors.        |
| 33. Black varnished tape.   | 71. Impulse recorder with recording paper Rolls. |
| 34. Silk & Tenanco blotting cloth.                                  | 72. Valve holders and valve shields.             |
| 35. Sleeveings.   | 73. Carbon film resistor.                        |
| 36. Permalloy.  | 74. Ceramic capacitors.                          |
| 37. Phenol fibre sheets/strips/rods.                                | 75. Metallised mylor.                            |
| 38. Neoprene coated phenol fibre                                    | 76. Styroflex                                    |
|   | 77. Antisurge fuses.                             |
|   | 78. Key and Key mountings.                       |

79. Discrepancy switches, NSF cutter hammer switches, push button switch, venner time switch and dummy position indicator switch.
80. Crystals and crystal ovens.
81. Mercury vetted relays.
82. Magnetic counter.
83. Relay plate and base.
84. Mercury tube switch relay
85. Carpenter polarised relay.
86. TRLS Relays.
87. Polarised Relays.
88. S & H type/telegraph Relays.
89. Quintuple Relays.
90. Assembly test equipments.
91. High speed switching transistor.
92. Wire wrapping guns.
93. Moulded terminals.
94. Thermoinic temperature control unit.
95. Special type of motors and meter coil winding machine.
96. Hermetically sealed meters.
97. Telephone dials.
98. VHF couplers.
99. Echo Equalisers.
100. Brass eyelets.
101. Busbar clamps.
102. Bracket insulators.
103. Jack strips.
104. Uprights.
105. Tapping attachments.
106. Tungsten contacts.
107. Tools & gauges of various types.
108. Press tools required for the manufacture of components required in the telecommunication equipment.
109. Moulding tools required for the manufacture of components required in the telecommunication equipment.
110. Special tools Crossbar project such as perforate/pierce/clip/emboss tool, P & D combined perforate and blank tools.
111. Injection moulding tool and die inserts etc.
112. Compression springs for press tools such as coil springs, cup washers, rubber buffers, etc.
113. Piercing punches and durable punches.
114. Mallory electrodes (spot welding).
115. Jig boring tools and accessories.
116. Thread button dies.
117. Pneumatic diecutter/midget screw drivers
118. Precision special vice.
119. "Thiol" type machine files.
120. Tapping heads & dies.
121. Precision needle files.
122. MSS Special bobbing cutters, tapes, dies & broaches.
123. Tapping, attachments.
124. Fluteless/two Fluted taps.
125. Feeler gauges.
126. Electric wrapping guns with bits & sleeves.
127. Diamond mendrels.
128. Wiper cord tracers.
129. Isoadopters.
130. Stripline terminations.
131. Leak tester and vibration tester.
132. Logic characteristic analyser.
133. Automatic Capacitance and Tan Delta Bridge/Meter for Capacitors.
134. Leakage Tester for Hermetically Sealed Film Capacitors.
135. Distortion Analyser.
136. High Frequency Oscilloscopes above 100 Mc/s
137. VHF/UHF Modulator
138. Low & Flutter Meters.
139. Low & Flutter wave Analysers.
140. Low & Flutter Calibrators.
141. Torque Gauges/Meters.
142. Tension Meters.
143. Noise Meter.
144. Contact Resistance Meter 0.100 milli ohm

**Import Duty on representative items of Raw Materials, Components and Equipment of  
Electronics Industry**

Component	Raw materials for the component	Present rate of Import Duty (percentage)
<b>Telescopic Aerials</b>		<b>137</b>
	Brass tubes thinner than 32 SWG dia. ranging from 2 mm to 13 mm	124
<b>Loudspeakers :</b>		<b>137</b>
	Spider cloth/spiders of dia 2 1/8" and above	89
	Weather proof voice coil paper	186
	Enamalled copper wire thinner than 44 SWG	89
	Adesives and Solvents	89
	Chemical & other items :	
	Plastic Glue	208
	Araldite hardner specially formulated hardners	208
	Araldite resin and alvitite	208
	Solvents	208
	Epoxy resin	208
	Lebasol	208
	Opanol	208
	Polymethacrylic Resin	230
	Bensilidine Acetone	89
	Electrical Insulating Paper, Kraft paper	89
	Potassium Stannate	89
	Thermoplast wire (Solderable verietiy)	89
<b>R.F. &amp; I.F. Transformers/Coils and Tuning Coils :</b>		<b>137</b>
	Polycarbonate moulding power	145
	Ferrite & Iron dust cores not exceeding 7 mm length	51
	Miniature tubular ceramic capacitors	137
	Ozokerite Wax	†
	Japanese Wax	:
	Montan Wax	:
	Micro-crystalline Wax)	:
	Paya Wire	101
	Polypropylene moulding power	208
<b>Plastic Film Capacitors :</b>		<b>137</b>
	Metallized or plain film polyostyrene/polycarbonate/ polypropylene etc.	75
	Special tin foil/lead foil/zinc foil/copper foil	75
	Epoxy resin, polyester resin,	208



Component	Raw materials for the component	Present Rate of Import Duty (Percentage)
	Epoxycompound resin their hardners and solvents	208
	Polyester/Polystyrene/Polycarbonate/Stick/rod, foil etc.	230
	Diphenyl propane resin	208
	Aluminium Foil 99.9% above purity	170
	Aluminium Solder	75
	Silicon Grease	75
<b>Gang Condensers Air Dielectric :</b>		<b>137</b>
	Brass Rods 6 mm to 8mm dia dent free close tolerance in microne	75
	Ceramic studs	175
<b>PVC Gang Condensers</b>		<b>137</b>
	Polyethylene foil/strip 0.65 mm thick approx.	208
<b>Paper Capacitors :</b>		<b>89</b>
	Aluminium metallized paper	208
	Kraft tissue paper/condenser tissue paper, condenser paper electrical grade	186
	Epoxy Coumorone resin	208
	Copper/Nickel coated porcelain	153
	Polypropylene foil films	75
<b>Electrolytic Capacitors :</b>		<b>137</b>
	Condenser paper/condenser tissue paper	186
	Epoxy coumorone Resin	208
	Stamping ink	89
	Boric Acid high purity	89
<b>Carbon Resistors :</b>		<b>137</b>
	Epoxy resin ester	280
	Stamping ink	89
	Polyvinyl acetate	208
	Methyglycol acetate	89
	Vegetable glue	89
<b>Wirewound Resistors :</b>		<b>137</b>
	Resistance Wires	89
	Resistance tape thinner than 30 SWG	89
	Silicon resin :	
	Enamel Powder :	Electronic Grade
	Nickel Silver Srips :	208
<b>Cones for Loudspeakers :</b>		<b>137</b>
	Plastic Glue, Phonolic Resin, Rubber Glue Mohilsan 'M'	208

Component	Raw materials for the component	Present rate of Import Duty (percentage)
<b>Potentiometers &amp; Volume Controls :</b>		<b>137</b>
	Polycarbonate/phonolic resin/Ethylalcohol 99% ABS Materials,	
	Nylon Powder, Dimethyl Alcohol 99%	230
<b>Transistors &amp; Diodes :</b>		<b>137</b>
	Photolithographic Materials	120
	Gold wire and preformer	120
	Glass Seals	127.5
	Epoxy Resins	45
	Precious metal plated articles	137
	Ceramic Insulators	89
<b>Selenium Rectifiers :</b>		<b>137</b>
	Selenium	89
	Tin Cadmium alloy	89
<b>Silicon Rectifiers</b>		<b>137</b>
	All components going into silicon rectifiers, including glass to metal film, wafers and special bases	75
<b>Aluminium Electrolytic Capacitors :</b>		<b>137</b>
	Etched Aluminium Foil	172
	Etched Cathode Foil	172
	Anode Ribbon	127
	Cathode Ribbon	127
	Tissue Paper	75
	Adhesive Tape	142
	PVC Sleeve	230
	Marking Ink	75
	Chemicals	164
	Silicon Oil	208
	Mineral Oil	208
	Copper Wire	92.5
	Bungs	120
	Can	75
	Inserts	120
	Paddles	120
	Cover	75
	Vent Rubber Disc	120
	Washer	75
	Rivet	75
	Cathode	75
	Soldering Lug	120
	Insulation Disc	120
	Glue	208

Component	Raw materials for the component	Present rate of Import Duty (percentage)
<b>Piezo Electric Quartz Crystals :</b>		<b>137</b>
	Synthetic Quartz	75
	Sio abrasive quartz grinding grade	75
	Synthetic aluminium oxide powder	75
	Rough Polishing Powder	75
	Conductive silver paste	115
	Bases (Metal)	120
	Covers (Metal)	75
	Binder & straps	120
	Socket & springs	120
	Nickel eyelets	75
	Phosphor/bronze headed wire (1 mill, gold plated)	120
	Carriers for PRI, PR2, PR3	
	Plastic	120
	Blue Steel	120
	Zinc	55
<b>Electro Magnetic Components :</b>		<b>137</b>
	Silver Paste	120
	Silver Solder	120
	Polyester Tape Electrical Grade	230
	Acetate Tape	230
	Shrinkable Polyolifine Tube	230
	Supple PVC Adhesive Anticorrosion	142
	Solder 60/40	75
	Glass Tubes (Screened)	185
	Terminals ground terminals IN/OUT	75
	Enamelled insulated copper wire	84
	Marker	120
	Squeezes	274
	Soldering flux	75
	Frame and Printing Screen	120
<b>Carbon Film Resistors :</b>		<b>120</b>
	Ceramic body	75
	Metallic strip for caps	120
	Marking ink	75
<b>Wire wound resistors and potentiometers</b>		<b>137</b>
	Resistance Wires (Cupro-Nickel & Nickel-Chromium)	120
	Beryllium Copper	75
	DAP Moulding Powder	208
	Subminiature Micro Brush Precision Metal Alloys (Gold/PT AG Alloy)	137
	Alumina Substrates (Thin 0.1 mm)	89

Component	Raw materials for the component	Present rate of Import Duty (percentage)
<b>Tantalum Capacitors :</b>		<b>137</b>
	Silicon Elastomer (Rubber)	45
	Tantalum wire	45
	Nickel wire	45
	Silver conductive Composition	137
	High Temperature Heat Shrinkable Tubings (Polyester)	230
	Epoxy Moulding Powder (Moulding Epoxy)	45
	Tantalum Powder	89
<b>Nickel Cadmium Cells :</b>		
	Nickel Powder Wiremesh Strips	89
	High Absorbent Separatar Cloth	208
<b>All Electronic equipment including those using above components eg</b>		<b>51 to 89</b>
<b>Oscilloscopes</b>		<b>89</b>
<b>Signal Generators</b>		<b>89</b>
<b>Test and Measuring Instruments</b>		<b>89</b>
<b>Other electronic equipment</b>		<b>51</b>
<b>Computers and subsystems</b>		<b>54</b>
<b>Computer Peripherals</b>		<b>119</b>



## Gascading effect of excise duty and other taxes on cost of Radio Receivers

	Model A		Model B		Model C		Model D	
	Basic	Taxes	Basic	Taxes	Basic	Taxes	Basic	Taxes
<b>Direct Costs</b>								
1. Materials, parts etc	66.50	14.00	93.00	21.00	117.00	27.00	75.00	17.00
2. Direct Labour	3.50		5.00		7.00		5.00	
3. Factory Supervision	1.00		1.50		2.00		1.50	
4. Factory overheads	3.00		4.50		6.00		4.50	
5. Pack & Forward	1.50		2.00		2.50		2.00	
<b>Indirect Costs</b>	75.50	14.00	106.00	21.00	134.50	27.00	88.00	17.00
	17.50	—	25.00	—	32.50	—	6.00	—
<b>Cost of Production</b>	93.00	14.00	131.00	21.00	167.00	27.00	94.00	17.00
<b>Manufacturer's Margin</b>	3.75	5.00	5.00	7.00	6.50	9.00	3.20	4.43
<b>Therefore Ex-Fac. Price</b>	96.75	19.00	136.00	28.00	173.50	36.00	97.20	21.33
<b>Excise</b>	—	17.35	—	24.60	—	52.38	—	17.78
<b>Therefore Dealer Price</b>	96.75	36.35	136.00	52.60	173.50	88.38	97.20	39.11
<b>Dealer Margin</b>	20.00		30.00		40.00		20.00	
<b>CST (4%)</b>	—	6.12	—	8.74	—	12.08	—	6.20
<b>Local ST (8%)</b>	—	12.74	—	18.19	—	25.12	—	13.00
<b>Octroi (4%)</b>	—	6.88	—	9.82	—	13.56	—	7.02
<b>Handling</b>	2.00	—	3.00	—	4.00	—	3.00	—
<b>Licence</b>	—	15.00	—	15.00	—	15.00	—	15.00
<b>Total</b>	118.75	77.09	169.00	104.35	217.50	154.14	120.20	80.37
<b>Total including taxes</b>	195.84		273.35		371.64		200.57	
<b>Percentage of</b>	65%		60%		70%		66%	
<b>tax to total (excluding tax)</b>								

## Electronic Items subject to Excise Duty

Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
<b>33A—WIRELESS RECEIVING SETS</b>				
33A	Wireless receiving sets, all sorts, including any combination of two or more of the following, namely, Broadcast Television receiver sets, Radios (including Transistor sets), Gramophones (including Record Players), Record playing decks and Record changing decks), Tape Recorders (including cassette recorders and Tape decks) and Tape Players (including cassette players) in each case, whether with or without Loud Speakers :			
	(1) Broadcast television receiver sets	30%	0	30% a.v.
	(2) Radios (including transistors sets)	40%	0	40% a.v.
	(3) Radiograms (including radio or transistor sets with extra space in cabinet for filling in record players or record changers)	40%	0	40% a.v.
	(4) Others	40%	0	40% a.v.
<b>Exemptions</b>				
33A	<b>Radiograms</b> fitted with imported or indigenous radios, gramophones, or parts and accessories of gramophones	Excise duty exemption equal to excise duty or additional (C.V.) duty paid on radios, gramophones or parts and accessories of gramophones, as the case may be, only if the manufacturer avails of Proforma Credit facility under rule 56A of the CET.		
33A	<b>Wireless receiving sets</b> assembled at home as a hobby from ready made kits by individuals for personal use.	0	0	0
33A(2)	<b>Radios (including transistor sets) of the following descriptions :</b>			
	(1) Sets of one or two bands	15%	0	15% a.v.
	(2) Sets of 3 bands and upto 250 rupees	25%	0	25% a.v.
	(3) Sets of 3 bands and value above 250 rupees and sets of 4 bands	35%	0	35% a.v.
	(4) Sets of 5 bands or more	40%	0	40% a.v.

Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	

**NOTE :** 15% reduction in excise duty available for small scale industrial units whose (i) total investment on plant and machinery is not more than Rs. 10 lakhs and (ii) total clearances for home consumption during preceding financial year did not exceed Rs. 1 crore. This will apply only to first clearances for home consumption upto a value of Rs. 50 lakhs during a financial year.

33A	<b>Radiograms</b> made by an assembler out of record players and radios in cabinets for which excise duty has been paid.	Exemption from excise duty equal to that paid on record players or radios.		
33A/ 37AA	Tape Recorders (including cassette recorders and tape decks), tape players (including cassette players) and combination sets of any of the aforesaid articles and transistor sets :			
	(a) of value not exceeding Rs. 500 each	25%	0	25% a.v.
	(b) of value exceeding Rs. 500 each	40%	0	40% a.v.

**NOTE :** Here also 15% reduction in excise duty is provided for small scale industrial where

- (i) Capital investment is not more than Rs. 10 lakhs
- (ii) total clearances for home consumption during the preceding financial year did not exceed Rs. 50 lakhs.

This reduction will apply only to first clearances for home consumption up to Rs. 25 lakhs during financial year.

33A.	<b>Any combination of two</b> or more of the following namely broadcast receiver sets, radios (including transistor sets), gramophones (including record players, record changing decks and record playing decks), tape recorders (including cassette recorders and tape decks) and tape players (including cassette players).	Exemption from excise duty equivalent to excise duty or additional (C.V.) duty paid on the individual items as listed, used in the manufacture or assembly of the said combination.		
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Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
33A	<b>Wireless receiving sets</b> (other than broadcast television receiver sets) manufactured by Central/State Governments and intended to be used by their agencies for benefit of public	0	0	0
33A	<b>Combination of</b> broadcast television receiver sets and radios (including transistor sets)	30%	0	30%a.v.
33A(2)	Radios (including transistor sets) upto a value of Rs. 165 per set manufactured in a small industrial unit where total investment on plant and machinery is not more than rupees ten lakhs.	0	0	0
33A(1)	<b>Broadcast television receiver sets</b> of the following Description : 1. <b>Single Channel sets :</b> a) of screen size not exceeding 36 cm, and of a value upto Rs. 1400 per set b) of screen size exceeding 36 cm. and a value upto Rs. 1600 per set 2. <b>Multichannel sets :</b> a) of screen size not exceeding 36 cm. and a value upto Rs. 1550 per set b) of screen size exceeding 36 cm. and a value upto Rs. 1750 per set	Provided the amount of payment for the first one year under an after sale-service agreement together with the value of the set does not exceed the specified value. 15%      0      15%a.v.		
	<b>33AA—PARTS OF WIRELESS RECEIVING SETS</b>			
33AA	Parts of wireless receiving sets (including parts of transistor sets and Radiograms), namely, electronic valves and tubes, transistors and semi-conductor diodes	Rs. 5 each	5% of the Basic Excise Duty	Rs. 5 each + 5% of the Basic Excise Duty

#### Exemptions

#### 33AA Parts of wireless receiving sets of the following description :

1. Electronic valves and tubes

Rs 1.50 each	5% of the Basic Duty	Rs. 1.50 each + 5% of Basic Duty
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Central Excise Trariff Items	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
2.	Transistors and semi-conductor diodes	0	0	0
<b>NOTE:</b>	These parts of wireless receiving sets shall be totally exempt if used in the manufacture of electronic equipments other than wireless receiving sets falling under item 33A. Here some special procedure is followed.			
33D	<b>33D-OFFICE MACHINES</b> Office Machines and apparatus, including typewriters, calculating machines, accounting machines, statistical machines, intercom devices (but excluding telephones), teleprinters and auxiliary machines for use with such machines, whether in assembled or in un-assembled condition, not elsewhere specified.	20%	0	20% v.a.
<b>Exemptions</b>				
33D	Office Machines and apparatus falling under this item other than the following are exempted from the whole of the duty of excise leviable thereon :			
	<ol style="list-style-type: none"> <li>1. Typewriters including those incorporating Calculating device.</li> <li>2. Cheque writing machines.</li> <li>3. Teleprinters</li> <li>4. Calculating machines</li> <li>5. Accounting machines</li> <li>6. Cash registering machines</li> <li>7. Postage franking machines</li> <li>8. Automatic vending machines including ticket issue machines</li> <li>9. Totalisers</li> <li>10. Statistical machines including sorting and tabulating machines</li> <li>11. Punching machines</li> <li>12. Checking machines</li> <li>13. Reproducing machines</li> </ol>			

Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
	14. Interpreting machines			
	15. Hectograph or Stencil duplicating machines			
	16. Addressing machines			
	17. Coin Sorting Machines			
	18. Coin counting machines			
	18A. Coin Wrapping machines			
	19. Perforating machines			
	19A. Stapling machines			
	20. Letter folding machines			
	21. Letter opening machines			
	21A. Letter closing or sealing machines			
	22. Stamp cancelling machines			
	23. Machines for delivering wrapping paper or gummed tape			
	24. Machines for moistening gummed paper or stamps			
	25. Paper shredders of a kind used for destroying confidential waste			
	26. Dictating machines			
	27. Intercom machines			
	28. Photo-copying machines			
	29. Time-recording machines			
	29A. Attendance machines			
	30. Data Processing machines other than computers (including Central Processing Units and Peripheral devices).			
33D	Electronic calculating machines (other than slide rule calculating machines) of a value not exceeding Rs. 175 each	10%	0	10% a.v.
33D	Electronic slide rule calculating machines of value not exceeding Rs. 450 each	10%	0	10% a.v.
	<b>33DD—COMPUTERS</b>			
33DD	Computers (including Central Processing Units and Peripheral devices), all sorts.	25%	0	25% a.v.
<b>Exemptions :</b>				
33DD	Computers, cleared with indigenous or imported peripheral devices	Exemption from excise duty equivalent to excise duty or		

Central Excise tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
		additional (C.V.) duty already paid on such peripheral devices provided the value of the said computers includes the value of peripheral devices also.		
33DD	Computers sold to educational and research institutions – provided it is proved to the satisfaction of Assistant Collector in the form of a certificate from Department of Electronics that the institution is an app- roved research and educational institution.	0	0	0
	<b>33F—MUSICAL SYSTEMS</b>			
33F	Musical systems commonly known as Stereo or Hi Fi systems, namely :			
	1. Stereo or hi-fi amplifiers	40%	0	40 % a.v.
	2. Speakers and speaker systems housed in acoustically designed enclosures which are ordinarily used as attachments with stereo or hi-fi systems, or with radios (including transistor sets), tuners, ra- diograms), gramophones (including record players, and tape Recorders or players (including cassette recorders or players) having inbuilt stereo devices	40%	0	40% a.v.
<b>Exemptions :</b>				
33F	Goods falling under this item, if manufac- tured in a small scale industrial unit, where (1) total capital investment on plant and machinery is not more than Rs. 10 lakhs (2) total clearance for home consumption during the preceding financial year did not exceed Rs. 1 crore. This exemption shall apply only to first clearances, if any, for home consumption, upto a value of Rs. 50 lakhs during financial year.	25%	0	25% a.v.
	<b>37A—GRAMOPHONE &amp; PARTS</b>			
37A	Gramophones, including record players, record playing decks and record changer			

Central Excise tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
	decks, whether mechanically or electrically driven with or without an inbuilt system of sound reproduction or amplification (acoustic, electronic or transistorised), and parts and accessories thereof not elsewhere specified and gramophone records, all sorts :			
	i) Gramophones, record players, record playing decks or record changer deks.	25%	0	25% a.v..
	ii) Parts and accessories of gramophones, record players, record playing decks; or record changer decks.	30%	0	30% a.v..
	iii) Gramophone records all sorts, other than matrices	15%	0	15% a.v..
	iv) Matrices for records impressed	30%	0	30% a.v.
	v) Gramophone needles or styli			
	a) wholly made of steel	20%	0	20% a.v..
	b) Others	25%	0	25% a.v..
<b>Exemptions :</b>				
37A(v)(a)	<b>Gramophone needles</b> wholly made of steel	0	0	0
37A(iv)	<b>Matrices for records</b> , impressed, used in the factory in which such Matrices for records impressed, have been produced	0	0	0
37(A)	<b>Mechanically driven gramophones</b> and parts thereof	0	0	0
37A(ii)	All parts and accessories of electrically or battery operated gramophones, record changer decks, except			
	(i) Motors electrically or battery operated			
	(ii) Turn table used in electrically or battery operated gramophones, record players, record playing decks or record changer decks and manufactured in the factory of manufacture of gramophones;			
	(iii) Turn table mat;			
	(iv) Pick up arm;			
	(v) Pick up mount;			
	(vi) Pick up rest;			
	(vii) Pick up cartridge.			

Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
37A (iiii)	<b>Gramophone records</b> , other than L.P.'s. or E.P.'s (vide Note 80/79 dated 1.3.1979)	0	0	0
37A (ii)	<b>Parts of gramophones</b> , record players, record playing decks record changer decks, <b>used in the factory of production</b> in the manufacture or assembling of goods falling under sub-item (i) i.e., the finished goods	0	0	0
37A (ii)	<b>Parts of gramophones</b> , record players, record playing decks or record changer decks, whether indigenous or imported, received from outside the factory of production and used in the manufacture or assembling of the aforesaid goods falling under sub-item (i).	Exemption from excise duty on finished goods equivalent to excise/additional duty paid on such parts.		
37A (i)	Gramophones, record players, record playing decks or record changer decks, manufactured in small scale units, where (i) total capital investment on plant and machinery is not more than Rs. 10 lakhs. (ii) total clearances for home consumption during the preceding financial year did not exceed Rs. 50 lakhs. This reduction shall apply only to first clearances upto a value of Rs. 25 lakhs in a financial year.	10%	0	10% a.v.
<b>37AA—TAPE RECORDERS</b>				
37AA	Tape recorders (including cassette recorders and tape decks) and tape players (including cassette players)	40% a.v.	0	40% a.v.
<b>Exemptions</b> 37AA	<b>Taperecorders</b> (including cassette recorders)	Exemption from Excise Duty equivalent to excise/additional duty already paid on tape decks used in the manufacture/assembly of such tape recorders (including cassette recorders). See 33A also.		

Central Excise Tariff Item	Description of Goods	Rate of		Total Duty Rate
		Basic Excise Duty	Special Excise Duty	
66—PERMANENT MAGNETS				
66	Permanent magnets	50% a.v.	0	50% a.v.
Exemptions				
66	Permanent magnets, other than cast alloy permanent magnets	0	0	0
66	Permanent magnets	30% a.v.	0	30% a.v.
66	Permanent magnets, manufactured by any Metallurgical Research Laboratory of the Ministry of Defence subject to certain conditions.	0	0	0
66—ALL OTHER GOODS N.E.S.				
68	All other goods, not elsewhere specified, but excluding :	8%	0	8% a.v.
	(a) alcohol all sorts including alcoholic liquors for human consumption;			
	(b) opium, Indian hemp and other narcotic drugs and narcotics, and			
	(c) dutiable goods as defined in section 2 (c) of the Medicinal and Toilet Preparations, (Excise Duties) Act, 1955			
Exemptions				
68	All goods manufactured by Central Government factories and intended for use by Department of said Government.	0	0	0
68	All goods manufactured by a State Government factory for purposes declared by Parliament by law to be incidental to the ordinary functions of the Government.	0	0	0
68	Goods manufactured in a factory and intended for use in the factory in which they are manufactured or in any other factory of the same manufacturer subject to certain conditions (vide Note 118/75)	0	0	0
68	Goods manufactured by small scale industrial units as defined	0	0	0
68	All exciseable goods (referred to as "said Goods") on which the duty of excise is leviable and in the manufacture of which any goods falling under item 68 (referred to as inputs) have been used—subject to certain conditions.	Exemption from excise duty on said goods equal to the excise duty already paid.		

**Factual Data on Broadcast Receiver Licence (BRL) Fees****Table 1 :**

Price of radio set at point of sale (Rs.)	Percentage of production in the price range			Annual BRL Fee (Rs.)	
	Small Scale (%)	Large Scale (%)	Average (%)	(Suggested IPAG) (Rs.)	Existing (Rs.)
Less than Rs. 75	15	—	7.5	Nil	7.5
75—150	45	20	32.5	3	7.5
151—300	35	65	50.0	5	15.0
301—500	5	13	9.0	8	15.0
501 and above	—	2	1.0	15	15.0

(Source : IPAG)

**Table 2 :**

(Figures in Lakhs)

Year	Total number of licences	Annual increase in licences	Production of radio receivers	Shortfall (col. 4-3)
1.	2	3	4	5
1971	123.7	6.2	30.2	30.2
1972	128.9	5.2	30.2	30.2
1973	140.3	11.4	26.2	14.6
1974	148.5	8.2	34.6	26.4
1975	167.7	19.2	26.0	6.8
1976	173.6	5.9	29.8	23.9
1977	200.1	26.5	37.6	11.1
Total		82.6	214.6	
Average		11.8	30.7	

(Source : IPAG)

**Table 3 :**

Year	Revenue from BR Licences (net in crores Rs.)	Revenue from commercials (in crores Rs.)	Revenue expenditure of AIR (in crores Rs.)
1970-71	13.88	2.96	13.07
1971-72	16.00	4.23	15.71
1972-73	15.54	4.70	16.64
1973-74	16.76	4.89	18.32
1974-75	18.44	5.39	25.91
1975-76	23.30	6.25	35.12
1976-77	23.27	6.80	44.80

**Table 4 :****Licence fee revenue at Rs. 7.50 per set from cheap sets**

Year	No. of Licences issued (in lakhs)	Gross Revenue (Rs. in lakhs)	Percentage of growth
1972	27.16	203.73	—
1973	30.52	226.89	12 %
1974	32.03	240.25	5.2%
1975	34.30	258.24	7.1%
1976	35.40	265.47	3.0%
1977	40.98	307.07	14 %

**Table 5 : (Sample Survey Results)**

In the sample	All India	the spread, over the country
1. Percentage of BRL of domestic sets renewed for 10 years	18.7	from 2.7 to 54.6
2. Percentage of BRL of domestic sets going unaccounted during 10 years	51.8	from 77.5 to 25.3
3. Percentage of BRL on cheap sets renewed for 10 years	8.5	from 0.9 to 28.1
4. Percentage of BRL on cheap sets going unaccounted during 10 years	62.0	from 85.1 to 35.9
5. Percentage of BRLs on domestic sets not renewed after one year	29.4	from 56.8 to 4.1
three years	46.5	from 72.8 to 15.3
6. Percentage of BRLs on cheap sets not renewed after one year	43.1	from 66.5 to 5.3
three years	66.4	from 83.3 to 22.3
7. Average period for which BRL on domestic sets are renewed and average life time revenue on the set	5.07 years Rs. 76.05	
8. Average period for which BRLs on cheap sets are renewed and average life time revenue on the set	3.44 years Rs. 25.80	



## GOVERNMENT OF INDIA MINISTRY OF FOREIGN TRADE

## RESOLUTION

New Delhi, the 23rd December, 1972

**No. 21 (15)/72-TAEP.** The Government of India have decided to set up an Export Processing Zone for electronic equipments and components at Santacruz, Bombay, with a view to promoting the exports of these items. The main features of this project will be :

- (1) It will be entirely export-oriented. The units admitted into the zone will be obliged to export 100% of their production.
- (2) The units in the zone are proposed to be given certain facilities and concessions in the matter of import of raw materials, components, capital equipments, etc.

2. The zone will be under the administrative control of the Ministry of Foreign Trade. The administration of the zone will vest in a Board to be set up for the purpose, and its progress will be reviewed periodically by the Government Body of the Santacruz Processing Zone Authority. The composition of the Board and of the Governing Body of the Authority will be notified from time to time.

3. Government have also decided to appoint a Development Commissioner for this Zone who will be in charge of its day to day administration. Pending the appointment of the Development Commissioner, Trade Development Authority may be requested to perform the functions of the Development Commissioner.

Sd/-

(A. S. GILL)

Joint Secretary to the Government of India

## ORDER

Ordered that this Resolution be published in the Gazettee of India, and that it be circulated to all concerned.

Sd/-

(A. S. GILL)

Joint Secretary to the Government of India

**Composition of the SEEPZ Board**

1.	Shri P. K. Kaul Additional Secretary Ministry of Commerce	President
2.	Shri G. S. Sawhney Additional Secretary Dept. of Revenue & Insurance Ministry of Finance	Member
8.	Shri N. K. Das Additional Secretary Ministry of Industry and Civil Supplies	Member
4.	Shri K. V. Seshadri Chief Controller of Imports & Exports	Member
5.	Shri N. K. Bhardwaj Executive Director Trade Development Authority	Member
6.	Shri P. C. Nayak Joint Secretary Dept. of Industrial Development Ministry of Industry & Civil Supplies	Member
7.	Shri D. K. Chatterjee Joint Secretary Ministry of Finance (DEA)	Member
8.	Shri A. F. Couto Joint Secretary Dept. of Heavy Industry	Member
9.	Shri M. K. Kukreja Joint Secretary Dept. of Company Affairs	Member
10.	Shri B. N. Makhija Development Commissioner SEEPZ, Bombay	Member
11.	Shri K. N. Ramaswamy DGTD, Deputy Director General	Member
12.	Shri T. R. Raman Director (Technical) Department of Electronics	Member
13.	Shri Ram Murthi Sharma Director Department of Commerce	Member Secretary
14.	Shri S. Rajagopal MD, MELTRON, Bombay	Member
15.	Shri Harbans Singh Executive Director, Indian Investment Centre, New Delhi	Member



**Governing Body Santacruz Electronics Export Processing Zone Authority**

- |    |  |          |
|----|--|----------|
| 1. | Shri C. R. Krishnaswamy Rao Sahib<br>Secretary of Commerce<br>Ministry of Commerce<br>New Delhi                                    | Chairman |
| 2. | Prof B. Nag<br>Chairman<br>Electronics Commission and Secretary,<br>Department of Electronics<br>Government of India,<br>New Delhi | Member   |
| 3. | Shri S. S. Marathe<br>Secretary to the Government of India<br>Ministry of Industry<br>New Delhi                                    | Member   |
| 4. | Shri G. Ramachandran<br>Finance Secretary<br>Department of Expenditure<br>Ministry of Finance<br>New Delhi                         | Member   |
| 5. | Dr Manmohan Singh<br>Secretary to the Government of India<br>Department of Economic Affairs<br>Ministry of Finance<br>New Delhi    | Member   |
| 6. | Shri S. Venkatesan<br>Central Board of Excise & Customs<br>North Block<br>New Delhi  | Member   |
| 7. | Shri P. R. Nangia<br>Deputy Governor<br>Reserve Bank of India  | Member   |
| 8. | Shri P. K. Kaul<br>Additional Secretary to the Govt of India<br>Ministry of Commerce<br>Udyog Bhavan<br>New Delhi                  | Member   |
| 9. | Shri K. V. Seshadiri<br>Chief Controller of<br>Imports & Exports<br>Udyog Bhawan<br>New Delhi 110011                               | Member   |



- |     |  |                  |
|-----|--|------------------|
| 10. | Shri P. D. Kasbekar<br>Secretary to Govt. of Maharashtra<br>Industries & Labour Department<br>Mantralaya<br>Bombay 400032        | Member           |
| 11. | Shri N. K. Bhardwaj<br>Executive Director<br>Trade Development Authority of India<br>Bank of Baroda Building<br>New Delhi 110001 | Member           |
| 12. | Shri B. N. Makhija<br>Development Commissioner<br>SEEPZ<br>Bombay 400096   | Member Secretary |
| 13. | Shri S. Rajagal<br>MD, MELTRON<br>Bombay   | Member           |



## Santacruz Electronics Export Processing Zone-Profile

Table 1 : Applications &amp; Approvals

Year	No. considered by the Board	No. rejected	No. approved
1973-74	55	21	34
1974-75	27	13	14
1975-76	16	5	11
1976-77	14	3	11
1977-78	13	4	9
1978-79	15	6	9
	<u>140</u>	<u>52</u>	<u>88</u>

Table 2 : Progress of Materialisation

	No. Approved	No. of cases materialised out of appd. cases	No. of cases not materialised	No. of cases still to come up
1. Foregin collabora- tion with par or majority foreign equity	15	6	3	6
2. Minority collaboration	18	6	5	7
3. Technical/ Marketing collaboration.	13	6	5	2
4. No collaboration	42	12	27	2
	<u>88</u>	<u>30</u>	<u>40</u>	<u>18</u>

Table 3 : Performance

	No. of units exporting	Of the units exporting, number which are			
		Healthy	Indifferent	Sick	Dead
1. Foreign collabora- tion with par or majority foreign equity.	6	6			
2. Minority collaboration	6	2	2	2	
3. Technical/ marketing collaboration	5		1	4	
4. No colla- boration	13	3	5	1	4
	<u>30</u>	<u>11</u>	<u>8</u>	<u>7</u>	<u>4</u>

**Table 4 : Exports**

	No. of units	Exports up to 31.8.78	Percentage to total exports
1. Foreign collaboration with par or majority foreign equity.	6	Rs. 711.66 lakhs	73.84%
2. Minority collaboration	6	Rs. 151.42 lakhs	15.72%
3. Technical/marketing collaboration	5	Rs. 6.90 lakhs	0.72%
4. No collaboration	13	Rs. 93.68 lakhs	9.72%

In four years the total exports have aggregated to just about Rs. 10 crores. 90% of the exports have been accounted for by the companies having some collaboration arrangement. Nearly three fourth of the total exports are accounted for by the six companies in the first category and less than 10% by the 9 Indian operating companies.

**Table 5 : Progress of Imports/Exports**

Year	No. of units exporting	No. of employees	Imports in Rs. lakhs **	Exports in Rs. lakhs ***
1974-75	5-0* = 5	150	28.34	4.88
1975-76	10-1* = 9	800	129.16	56.41
1976-77	19-1* = 18	1500	320.61	300.57
1977-78	26-2* = 24	1700	233.76	405.26
1978-79	26 = 26	1800	293.73	456.26
		(upto Dec. '78)	(upto Dec. '78)	(upto Dec. '78)
			10,05.60	12,24.00

\*Number of units withdrawn

\*\*Does not correlate to exports yearwise

\*\*\*Excess over imports yearwise does not indicate value added.

NOTE : The value added varies from 30% to 80% over the various units, the average being over 55%. Of the 42 active units in SEEPZ as in January 1979, 25 are approved for manufacture of components, 14 for equipment, 2 for instruments and 1 for software.

## Comparison of facilities and incentives in various export and free trade zones

S. No.	Facility, Incentive	SEEPZ (India)	KEPZ (Taiwan)	MASSAN (South Korea)	SINGAPORE	HONG KONG	PHILIPPINES	SHANON (Republic of Ireland)	PENANG (Malaysia)	SRI LANKA
1	2	3	4	5	6	7	8	9	10	11
1.	Import of raw materials, components, tooling, consumables, packing materials, office equipment, capital goods	—Duty free, no restriction on composition of imports— -presumably same as in other zones-								
2.	Export credit	Packing credit 11.5%	as in domestic tariff area	as in domestic tariff area	liberal at 6% interest				presumably liberal	
3.	Cash subsidies on export	Nil	Nil	Nil	Nil	Nil	Nil		-presumably same as in other zones-	
4.	Export obligation	100% including scraps & seconds	100% including scraps & seconds	100%	No ban on sale of portion of output in domestic market	No ban on sale of portion of output in domestic market	100% including scraps & seconds	N.A.	N.A.	N.A.
5.	Supporting industries	very good	fairly good	fairly good	fairly good	fairly good	not good	N.A.	N.A.	N.A.



1	2	3	4	5	6	7	8	9	10	11
6.	Approval of project licensing etc.	Single point scrutiny in zone, approval in a month	single point scrutiny in zone, clearance withing 7 days	single point scrutiny in zone, clearance rapid	No permission needed, by foreign capital, single point scrutiny quickest of all.	N.A.	N.A.	N.A.	N.A.	N.A.
7.	Import, export procedures	Unified in SEEPZ authority, linked to customs	Unified in zonal authority	instant import & export allowed	import & export freely allowed	N.A.	N.A.	N.A.	N.A.	N.A.
8.	Preferred industries, items	high, specifications and value added	labour intensive, light industry	labour trade, intensive limited in electro-nics, pre-fabrication machinery	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
9.	Exemption from taxes, tax holidays	Partial as for hinterland	5 Years' holiday; 25% there after	5 Years' holiday; Salaries, wages of foreigners exempt	5 Years tax holiday; 4% for next 10 Years	15% max. tax; profits generated abroad exempt	No export tax; municipal provincial tax or licence for 10 Yrs. Dividend-tax 15%	No income or corporate tax till 1990; dividends exempt from tax. Investment allowance 20%	Holiday for 5 Years. Tax on merits credit of 25% to 40% of fixed capital. No dividend tax.	5 Years holiday on merits with extension for 5 more.



	1	2	3	4	5	6	7	8	9	10	11
10. Grants		Grants	Nil	N.A.	N.A.	capital assistance scheme & training grants	N.A.	N.A.	non repayable capital grants upto 50%; grant upto 100% on training costs; rent reduction grants	N.A.	N.A.
11. Plant depreciation		Plant depreciation	Same, as for domestic tariff area	N.A.	N.A.	upto 100% in one Year, based on obsolescence; liberal at 6% rate of interest for 3 to 10 Years.	20% in 1st Year	20% accelerated depreciation allowed	—	100% accelerated depreciation allowed	generous capital allowance & indefinite carry forward of losses.
12. Foreign equity participation		Foreign equity participation	Permitted on merits	no restriction; 100% permitted	no restriction; 100% permitted	no restriction; 100% permitted	no restriction; 100% permitted.	N.A.	N.A.	N.A.	N.A.
13. Service charges		Service charges	1% on exports, 0.5% on imports	2.5% on exports, 0.1% on imports	2.5% on exports, 0.1% on imports (some years ago	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1	2	3	4	5	6	7	8	9	10	11
14. Rents:—										
i) land		Re. 1 sq M/Yr	Rs. 0.5/ Sq M/ Year	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ii) factory		Rs. 60/sq. M/Yr plus Municipal tax (50% to be for 1st three years).	offered on hire purchase Yr.	Rs. 60/- Sq. M/ Yr.	Rs. 3/- Sq. ft./ month	N.A.	N.A.	N.A.	N.A.	N.A.
15. Personal income- tax for residents		payable	payable	payable	payable	payable	—	—	—	—
16. Personal income- tax for foreigners working in the zone hinterland only available		exemption as in hinterland	exempt	exempt	exempt	exempt	—	—	—	no tax on earning of foreign personnel for 5 years.
17. Repatriation of capital, dividends, royalties etc.		under existing laws in hinterland	free	free	free	free	N.A.	N.A.	N.A.	N.A.

N.A.—Information not available.

**Indirect Taxes not refunded through Duty  
Drawback (Illustrative cases)**

(Value in Rs)

	Radio Receiver	Cassette Recorder
I. (a) Sales Tax ) C.S.T. )	2.66	9.45
(b) Octroi	0.81	4.70
(c) Duty on Electric Power/Coal/Oil	2.94	19.45
(d) All other non-refundable tax/duties	3.64	3.87
Total	10.05	37.47
II. FOB Value of Export	55.92	272.00
III. % of total of I to II	17.97	13.77

**Note :** The duties, surcharges, etc. on account of power, coal, and oil have been evaluated as a % of the ex-factory value of production and applied on the ex-factory cost of production per unit of product.

सत्यमेव जयते

**Share of small scale sector in assembly products of major  
consumer electronics items**

Item	Share of	
	Small Scale Sector (%)	Large Scale Sector (%)
1. Radio Receivers	52	48
2. TV Receivers	75	25
3. Tape Recorders	65	35
4. Record Players	30	70
5. Amplifiers	95	5
6. Calculators	60	40
Total Consumer Electronics	60	40



**Technology Development Council (TDC) Projects**

No. of on-going Projects from prior to October 1973 when TDC was set up		17
No. of applications received upto 31.3.1978	194	
No. of applications approved upto 31.3.1978		84
No. of projects approved during 1978-79		21
Total approved projects		122
Approved outlay on 122 projects		
Loan	Rs	3.80 crores
Grant - in - aid	Rs	18.98 crores
Total	Rs	22.78 crores
Funds released till now (April 1979)	Rs	18.39 crores

Sectorwise breakup of products area	No. of projects	Outlay approved (Rs crores)	Funds released (Rs crores)
1	2	3	4
1. Computer Systems & Applications	29	12.66 (55.58%)	11.39 (61.94%)
2. Materials & Components	42	5.03 (22.08%)	3.88 (21.09%)
3. Communication & Broadcasting Systems	14	2.44 (10.71%)	1.76 ( 9.57%)
4. Control System and Industrial Applications	20	1.50 ( 6.58%)	0.75 ( 4.08%)
5. Consumer Electronics & Instruments	17	1.15 ( 5.05%)	0.61 ( 3.32%)
Total	122	22.78	18.39

Note : Figures in bracket give percentage to total.

The abstract of project allotment to various agencies in the country is as below :—  
(Rs crores)

S. No.	Name of Agency	No. of Projects	Approved grant (loan component in brackets)
1.	Tata Institute of Fundamental Research, Bombay	11	9.13
2.	Electronics Corporation of India Ltd., Hyderabad	19	5.19 (2.44)
3.	Bharat Electronics Ltd., Bangalore	10	2.93 (0.46)
4.	India Institute of Science, Bangalore	9	0.65
5.	Central Electronics Engineering Research Institute, Pilani (CSIR)	5	0.61
6.	Central Electronics Ltd., Sahibabad	3	0.48 (50%)

7.	Kerala State Electronics Development Corporation and Keltron Crystals	6	0.46 (0.37)
8.	Indian Institute of Technology, Kanpur	4	0.41
9.	Indian Telephone Industries, Bangalore	1	0.30
10.	Indian Institute of Technology, Bombay	4	0.20
11.	National Physical Laboratory, Delhi (CSIR)	2	0.19
12.	Computer Maintenance Corporation	2	0.18 (50%)
13.	Institute of Petroleum Exploration, Dehra Dun	1	0.18
14.	Indian Institute of Technology, Delhi	4	0.18
15.	Punjab State Display Devices, Chandigarh	2	0.16 (50%)
16.	Electronics Trade & Technology Development Corporation Ltd.,	2	0.16 (50%)
17.	Space Applications Centre, Ahmedabad	1	0.14
18.	National Aeronautics Ltd., (CSIR)	3	0.12
19.	Indian Institute of Technology, Kharagpur	3	0.10
20.	Indian Institute of Technology, Madras	3	0.10
21.	Indian School of Mines, Dhanbad	3	0.10
22.	Orissa School of Engineering, Cuttack	1	0.10
23.	University College of Technology, Calcutta	2	0.09
24.	National Institute of Oceanography, Goa (CSIR)	1	0.09
25.	West Bengal Electronics Industry Development Corporation	1	0.07 (50%)
26.	Administrative Staff College of India, Hyderabad	2	0.06
27.	Jadavpur University	2	0.05
28.	Raman Research Institute, Bangalore	1	0.05
29.	Jute Technological Research Laboratory, Calcutta	1	0.05
30.	National Sugar Institute, Kanpur	1	0.03
31.	Nagarjuna University	1	0.03
32.	Harcourt Butler Technological Institute, Kanpur	1	0.03
33.	Operations Research Group, Baroda	1	0.03
34.	Indian Institute of Management, Ahmedabad	1	0.03
35.	Central Scientific Instruments Organisation, Chandigarh (CSIR)	1	0.03
36.	Birla Institute of Technology, Ranchi	2	0.02
37.	Central Mines Research Station (CSIR), Dhanbad	2	0.02
38.	University Department of Chemical Technology, Bombay	1	0.01
39.	Birla Institute of Technology & Science, Pilani	1	0.01
40.	System Research Institute, Pune	1	0.01
Total		122	22.78

**National Radar Council (NRC) Projects**

No. of project received since setting up of NRC in 1974			47	
No. sanctioned				26
Approved outlay	Grants-in-aid	Rs. 5.10 crores		
	Loans	Rs. 3.65 crores		
	Total			Rs. 8.78 crores
Funds released upto March 1979				Rs. 4.50 crores

**The allotment of projects sanctioned agencywise is as follows**

S. No.	Agency	No. of Projects	Approved value (loan component in brackets)
1.	Hindustan Aeronautics Ltd	2	2.83 (2.83)
2.	Indian Institute of Technology, Kanpur	1	0.97
3.	Indian Institute of Technology, Delhi	4	0.91
4.	Banaras Hindu University, Varanasi	1	0.88
5.	Bharat Electronics Ltd.	4	0.82 (0.82)
6.	Indian Institute of Science, Bangalore	2	0.59
7.	Indian Institute of Technology, Kharagpur	4	0.45
8.	Space Application Centre, Ahmedabad	1	0.37
9.	Indian Institute of Technology, Bombay and Tata Institute of Fundamental Research	1	0.27
10	University of Delhi	1	0.20
11.	Tata Institute of Fundamental Research	1	0.17
12.	Defence Electronics Research Laboratory, Hyderabad	1	0.11
13.	Indian Institute of Technology, Madras	1	0.10
14.	National Physical Laboratory, Delhi	1	0.09
15.	Indian Institute of Technology, Bombay	1	0.02
	Total	26	8.78

**Location of Test and Development Centres and  
Regional Laboratories**

**Electronics Test and Development Centre**

**State/Union Territory**

1. Andhra Pradesh
2. Haryana
3. Himachal Pradesh
4. Karnataka
5. Kerala
6. Madhya Pradesh
7. Orissa
8. Punjab
9. Jammu & Kashmir
10. Maharashtra
11. Rajasthan
12. Tamilnadu
13. Tamilnadu
14. Uttar Pradesh
15. Gujarat
16. West Bengal
17. Delhi
18. Chandigarh

**Location**

- Hyderabad  
Gurgaon  
Solan  
Bangalore  
Trivandrum  
Indore  
Bhubaneshwar  
Mohali  
Srinagar  
Poona  
Jaipur  
Adyar  
Hosur (Sub Centre)  
Kanpur  
Baroda  
Calcutta  
Delhi  
Chandigarh



**Regional Laboratories**

1. Regional Evaluation Laboratory (REL)
2. Controllerate of Inspection Electronics (CIL)
3. Test & Evaluation Centre (TEC)

- Bombay  
Bangalore  
New Delhi



**Electronics Corporation of India Limited (ECIL)**

**1. Actual production during the last 4 years :**

Product Group	1975-76	1976-77	1977-78	1978-79
	(Figures in lakhs of Rs)			
Nuclear instruments	245.15	185.80	225.46	254.10
Measuring & Industrial instruments	256.84	236.54	261.71	228.35
Resistors & Capacitors	152.36	162.25	201.39	259.34
Semiconductors	139.58	160.18	153.90	125.62
Power reactor instrumentation	155.39	191.35	236.15	306.39
Servo controls	74.98	75.16	86.36	88.17
Computers	513.10	656.28	645.17	534.21
Special products	92.94	95.91	114.23	135.13
Microwave instruments	49.99	31.82	36.55	56.10
Television	824.87	1015.65	1174.90	1222.28
Antenna systems	389.76	417.54	238.78	120.42
Ancillary industries	2.61	0.75	(-) 1.52*	1.85
<b>Total</b>	<b>2900.57</b>	<b>3230.23</b>	<b>3373.08</b>	<b>3454.02</b>

\*due to write off of obsolete closing inventory.

**2. Major Product Lines**

- (a) Nuclear instruments & systems
- (b) Test & Measuring Equipment
- (c) Other types of instruments-industrial, medical, etc.
- (d) Computers
- (e) Television Sets and CC TV
- (f) Antennas
- (g) Automatic Warning Systems
- (h) Axle Counters
- (i) PLCC Equipment
- (j) Facsimile transreceivers
- (k) Ferrite Core Memory

**Note—**(g) to (k) yet to go into production

- (l) Components-mainly—professional grade, like potentiometers, trimming pots, tantalum capacitors, metal film resistors, crystals, servo components, semiconductor devices, microwave components.

3. Value of production planned for 1978-79 — Rs 3909. 15 lakhs (including taxes)
4. Total number of employees of the company as on 1.1. 1979 — 6,342
5. Gross fixed assets as on 1.1.1979 — Rs 2024.21 lakhs
6. Net fixed assets as on 1.1.1979 — 858.66 lakhs

**Import of computers under special categories**

S. No.	Category	System details	Conditions	Remarks
1.	Indian Nationals returning from abroad	Computer and Computer Systems	Export of software upto 100% of money value of cost of system	Upto 100% of cost of equivalent new system if import is of second hand or used system
2.	Indian Nationals returning from abroad	Data processing and conversion equipments	Export of software upto 50% money value of cost of equipment	Upto 50% of cost of equivalent new equipment if import is of second hand or used equipment
3.	Software export companies and entrepreneurs with technical background	Computer and computer systems	Export of software upto 200% of money value of cost system	Upto 100% of cost of equivalent new system if import is of second hand or used system
4.	Software export companies and entrepreneurs with technical background	Data processing and conversion equipments	Export of software upto 100% of money value of cost of equipment	Upto 100% of cost of equivalent new equipment if import is of second hand or used equipment
5.	Export Houses	Second hand computer system	Import only under REP entitlement ; export of software upto 200% of money value of cost of equivalent new system	When import is for captive use ; if for improving management efficiency lesser export obligation considered

Note 1 : In 1976 a review indicated that about 15 old and obsolete computers mostly IBM 1401 were imported under above policy for operating service bureaus within the country. Thereafter import of second-hand equipment was banned from July 1976. From August 1978 import of second hand machines was again allowed but only of computers of contemporary design/technology under above categories. Few application have been received for import of contemporary second-hand computers till now, but quite a few have been received for data preparation/conversion equipment.

Note 2 : Whenever an export obligation of 50%, 100% or 200% of c.i.f. value is imposed as above, the guarantee for export of software is on extended basis i.e. 20% of obligation in the first two years, 30% each in the 3rd and 4th years and 20% in the 5th year. The monitoring of the software export is done by the CCI & E being a condition attaching to the import licence and little information is available with Department of Electronics.

Note 3 : The Computer Maintenance Corporation is allowed import in bulk of used data preparation and conversion equipment for refurbishment and sale to users as per release orders issued by the Department of Electronics.

### Policy Guidelines for Import of Computers

(As approved by the Cabinet on 4th December, 1975)

The procedure as outlined below will be implemented by the Department of Electronics for import of computer systems over a value of Rs 5 lakhs c.i.f

**(a) Step-I (Action by users)**

Each user will outline the application for which a computer system has to be obtained through import, as necessary. On the basis of such defined usage, the user will draw up functional specifications, based on his current and anticipated application. In the case of general-purpose Government user such as Customs, Income-tax, Audit and Insurance, with offices/units located in Delhi, and which are either already using the Computer Centres of the Department of Statistics or can be expected, in terms of their requirements, to do so in the future, the Department of Statistics will be consulted, as necessary.

**(b) Step-II (Action by Department of Electronics)**

The justification for the applications envisaged, in terms of national priorities as laid down by the Electronics Commission from time to time, and the related specifications, will be scrutinised by the Department of Electronics (Computer Directorate); the Department will approve, in principle, the need for the import of a computer system with a certain functional configuration, which as a result of the technical scrutiny, may be different from that proposed by the user. The user would also be associated in deciding upon the functional configuration and convinced of the necessity of the change should any be considered necessary.

**(c) Step-III (Action by Department of Electronics)**

After such a clearance, in principle, the Department of Electronics will obtain competitive sealed tenders from various manufacturers/agents.

**(d) Step-IV (Recommendations by Expert Committee)**

The Department of Electronics will constitute a Committee of Experts consisting of hardware/ software and system specialists, for evaluating the tenders and making a technical recommendation thereon. Specialists from the user organisation will be invited to meetings of this Committee. Prior to initiating the evaluation, the user will be asked by the Department of Electronics to provide the Committee, a ranking of his preferences of computer types, together with the reasons for such a ranking.

**(e) Step-V (Approval by Approval Committee)**

The recommendations of the Committee of Experts will be put up to an Approval Committee consisting of :

- |   |          |
|---|----------|
| (i) Chairman, Electronics Commission        | Chairman |
| (ii) A member of the Electronics Commission | Member   |

(iii) Secretary, Department of  
Economic Affairs

Member

In addition, the Secretary of the Department of which the user organisation is a part or is administratively associated, will be co-opted to the Approval Committee, when cases concerning those user organisations are taken up. In case the user department does not agree, the decision of the Approval Committee will be final. Contracts for the computer finally chosen will be placed by the user organisation concerned.

- (f) For computers imported under the above policy guidelines, clearance from the indigenous angles and other functions, normally discharged by the DGTd, will be handled by the Department of Electronics.
- (g) The procedure outlined above will not apply to computers, programmable calculators, mini-computers, etc., entailing an outlay of Rs. 5 lakhs or less c. i. f. in foreign exchange for which existing Government procedures will continue vide letter No. 1/EC/75 dated April 2, 1975 from Secretary, Electronics Commission to all Secretaries of the Government of India.

**NOTE :**

- (i) The functioning of the procedure will be reviewed after a period of two years.
- (ii) The time taken for finalising the specification and evaluating the tenders under this procedure should not exceed three months.

**Post script :**

As per requirement in Note (i) above, the functioning of the procedure was reviewed by the Electronics Commission in September, 1978 and in November, 1978. The Department of Electronics on the basis of the review by the Electronics Commission, decided that the import of all computer systems should continue to be made only with the prior permission and approval of the Department of Electronics in accordance with a special procedure; but that there was need to liberalise some aspects of the present policy and procedure, with a view to providing greater involvement of users particularly in the case of industrial enterprises, and also to streamline the various approval steps so as to reduce the total time involved in procurement of imported computer systems. Based on these principles, the following modifications were recommended in the procedure (which are now to be reviewed in the light of the recommendations of the Review Committee set up by the Prime Minister in December, 1978) :

## **Existing Procedure**

## **New Procedure recommended by the Electronics Commission**

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### **Step I**

Each User will outline the application for which a computer system has to be obtained through import. On the basis of such defined usage, the user will draw up functional specifications.

### **Step I**

No change.

Obtaining financial approvals, as also clearance from the Ministry of Labour, on aspects relating to automation, as necessary would be the responsibility of the user.

### **Step II**

The justification for the applications envisaged, in terms of national priorities, as laid down by the Electronics Commission from time to time, and related specifications will be scrutinised by the Department of Electronics (Computer Directorate). The Department will approve, in principle, the need for the import of a computer system with a certain functional configuration; which, as a result of the technical scrutiny may be different from that proposed by the user. The user would also be associated in deciding upon the functional configuration and convinced of the necessity of the change, should any be considered necessary.

### **Step II**

No Change

### **Step III**

After such a clearance in principle, the Department of Electronics will obtain competitive sealed tenders from various manufacturers/agents.

### **Step III**

After such a clearance, in principle, the Department of Electronics will obtain competitive sealed tenders from various manufacturers/agents for all Government, Departments including those making procurement through DGS&D and other such organisations. In case of public and private sector enterprises, the user would float tenders using the standard tender formats of the Department of Electronics and incorporating in it the configuration and specification finalised in Steps I & II above.

#### Step IV

The Department of Electronics will constitute a Committee of Experts consisting of hardware/ software and system specialists, for evaluating the tenders and making a technical recommendation thereon. Specialists from the user organisations will be invited to meetings of the Committee; prior to initiating the evaluation, the user will be asked by the Department of Electronics to provide the Committee, a ranking of his preferences of computer types, together with his reasons for such a ranking.

#### Step V

The recommendations of the Committee of Experts will be put up to an Approval Committee consisting of :

- |       |   |     |          |
|-------|---|-----|----------|
| (i)   | Chairman,<br>Electronics<br>Commission            | ... | Chairman |
| (ii)  | A Member of<br>the Electronics<br>Commission      | ... | Member   |
| (iii) | Secretary<br>Department of<br>Economic<br>Affairs | ... | Member   |

In addition, the Secretary of the Department of which the user organisation is a part or is administratively associated, will be co-opted to the Approval Committee, when cases concerning those user organisations are taken up. In case the user Department does not agree, the decision of the Approval Committee will be final. Contracts for the computer finally chosen will be placed by the User organisation concerned.

#### Step IV

The Department of Electronics will constitute a Committee of Experts consisting of hardware/software and systems specialists for undertaking a total evaluation of the tenders, including technical aspects as also an assessment of the appropriateness/reasonableness of the price, and make overall recommendations thereon to Government. Representatives of concerned Government Department and a specialist of the user would also be members of this Committee of Experts. Prior to initiating the evaluation, the user will be asked by the Department of Electronics to provide the Committee a ranking of his preferences of computer-types together with his reasons for such a ranking.

#### Step V

Based on the assessment and final recommendation of the Committee of Experts involved in Step IV, the user would approach the Department of Economic Affairs for release of FE. On receipt of this application, the Department of Economic Affairs would refer the case on file to Chairman, Electronics Commission and then Secretary, Department of Economic Affairs, for their approval. Based on these approvals, the Department of Economic Affairs, will issue the FE release to the user under intimation to the Department of Electronics. The Department of Electronics would then issue the formal import clearance letter to the user and the import licence would be issued by the CCI & E on the basis of EE release by the Department of Economic Affairs and the import clearance communication from the Department of Electronics. Contracts for the computer finally chosen will be placed by the user organisation concerned. The Department of Electronics will provide the users with standard formats in which all necessary aspects relating to spares, warranty, maintenance etc. are fully taken care of.

**Ideal schedule for import of computers under present procedure**

<b>Activity</b>	<b>Estimated time involved</b>
(a) Finalisation of system specifications (User-DOE discussions)	1 to 2 months
(b) Financial/Labour approvals	1 to 2 months
(c) Invitation of tenders and receipt of quotations	2 months
(d) User comments	2 months
(e) Technical Evaluation	1 month
(f) Price Negotiations	1 month
(g) Final Approval	1 month
(h) Finalisation of purchase agreement including legal aspects of the contract	1 to 2 months
(i) Time from placement of order to delivery	4 to 12 months
	<hr/>
	14 to 25 months
	<hr/>



## Time taken for procurement of Computers

Sl No.	Name of Importing Organization	Date/month of receipt of application	Date/month of approval of system configuration	Date/month of evaluation of tenders	Date/month of approval by Approval Committee	Value of System (Rs. in lakhs approx.)	Date/month of ordering Computer System	Date/month of receipt of Computer System	Time from application to approval (in months)	Time from application to approval (in months)	Time from application to approval (in months)	Time from application to approval (in months)
1	2	3	4	5	6	7	8	9	10	11	12	12
1.	R. C. C. Calutta	Sept 71	Jan 74	Feb 75	29.3.76	83	31.3.76	Jan 77	54	64	P	P
2.	D.R.D.L. Hyderabad	Apr 75	Jul 75	6.10.75	31.3.76	79	NA	NA	7	NA	G	G
3.	Institute of Agricultural Research Statistics, New Delhi	NA	Feb 74	6.3.76	20.4.76	58	NA	Mar 77	26	37	G	G
4.	Escorts Ltd., Faridabad	11.9.75	NA	NA	15.6.76	15	NA	NA	9	NA	PR	PR
5.	I.O.L. Chemicals Hyderabad	15.11.75	Dec 75	Feb 76	15.6.76	14	NA	Jun 77	7	19	PR	PR
6.	Indian Airlines	May 76	NA	NA	6.5.76	49	NA	NA	2	NA	P	P
7.	O.N.G.C., Dehradun	21.5.76	NA	NA	9.7.76	7	NA	NA	2	NA	G	G
8.	India Meteorological Department, Poona	Apr 76	1974	NA	9.8.76	40	NA	NA	4	NA	G	G
9.	CVRDE, Avadi, Madras	Nov 75	NA	15.1.76	6.9.76	15	28.6.78	NA	2	NA	G	G
10.	B.A.R.C., Bombay	31.3.76	6.7.76	NA	8.12.76	NA	NA	NA	11	NA	G	G
11.	Telecommunication Research Centre, New Delhi	13.4.76	NA	NA	24.8.76	17	30.11.76	NA	4	NA	G	G
12.	H.A.L., Bangalore	28.8.76	NA	NA	18.10.76	10	NA	Sep 77	2	12	P	P
13.	Computronics India New Delhi	18.5.76	NA	NA	18.10.76	55	NA	Jan 77	5	8	PR	PR
14.	Planning Commission	Mid 1975	NA	17.9.76	11.12.76	39	NA	Aug 77	18	26	G	G
15.	Air India	9.9.76	NA	NA	8.12.76	29	NA	NA	3	NA	P	P



1	2	3	4	5	6	7	8	9	10	12	13
16.	T.I.F.R., Bombay	20.8.77	NA	NA	1.9.77	9	NA	Aug 78	1	12	G
17.	India Meteorological Department, Delhi	28.8.76	NA	NA	21.2.77	24	NA	NA	6	NA	G
18.	Computronics India Ltd., New Delhi	4.11.76	NA	NA	28.2.77	40	NA	Apr 77	4	6	PR
19.	Hinditron Computer (P) Ltd.	26.10.76	NA	NA	17.3.77	12	NA	NA	5	NA	PR
20.	O.N.G.C., Dehradun	20.11.76	NA	NA	28.2.77	8	NA	NA	3	NA	G
21.	Computer Engg. Services, Bombay	18.1.77	NA	NA	31.5.78	9	27.2.79	NA	17	NA	PR
22.	Shri S.M. Mehta, Bombay	2.12.77	NA	NA	31.3.77	18	NA	NA	4	NA	PR
23.	Ravi and Ashok Enterprises, Poona	10.3.77	NA	NA	26.11.77	24	NA	25.9.78	9	19	PR
24.	Banaras Hindu University, Varanasi	1975	Dec 75	NA	14.4.77	NA	NA	NA	22	NA	P
25.	Roorke University, Roorke	1975	Dec 75	NA	14.4.77	NA	NA	NA	22	NA	P
26.	R.C.C., Poona	1975	Dec 75	NA	14.4.77	NA	NA	NA	22	NA	P
27.	R.C.C., Chandigarh	1976	Dec 76	NA	14.4.77	NA	NA	Apr 79	10	NA	P
*28.	Shri Kianwar Mohan Oberoi (Singapore), Bombay	15.4.77	NA	NA	16.5.77	9	NA	NA	1	NA	PR
*29.	Tata Consultancy Services, Bombay	3.1.77	NA	NA	31.5.77	15	NA	NA	5	NA	PR
30.	Air India	30.6.76	NA	NA	6.8.77	77	NA	NA	19	NA	P
31.	Dunlop India, Calcutta	Jul 75	Sep 75	4.6.77	8.3.78	86	NA	NA	9	NA	PR
32.	Base Institute, Calcutta	12.11.76	NA	NA	4.8.77	26	NA	NA	9	NA	P
33.	Tata Consultancy Services, Bombay	23.6.77	NA	NA	9.8.77	6	NA	NA	2	NA	PR
34.	National Dairy Development Board, Anand	Sep 74	Jun 75	NA	4.11.77	120	NA	Nov 78	38	50	P
35	Indian Statistical Institute, Calcutta	21.7.76	NA	NA	2.10.77	34	NA	NA	4	NA	P

1	2	3	4	5	6	7	8	9	10	11	12
36.	Titan Project, ONGC	Jun 77	NA	NA	27.9.77	81	NA	NA	4	NA	G
*37.	Shri Rajendra Dhir, New Delhi	15.7.77	NA	NA	31.10.77	6	NA	NA	4	NA	PR
38.	Bokaro Steel Ltd.	Jul 75	Oct 75	15.9.77	12.12.77	93	NA	NA	30	NA	P
*39.	Shri Mahendra Nath, USA	5.7.77	NA	NA	12.1.78	9	NA	NA	6	NA	PR
*40.	Shri Basant Kharbanda	13.12.77	NA	NA	11.1.78	9	NA	NA	13	NA	PR
41.	J.C.B., New Delhi	1975	Sep 75	Jan 76	17.1.78	21	NA	NA	30	NA	G
42.	BHEL, Delhi	NA	NA	3.10.77	8.3.78	62	NA	NA	NA	NA	P
43.	BHEL, Hardwar	NA	NA	3.10.77	8.3.78	66	NA	NA	NA	NA	P
44.	Indian EDP Centre, New Delhi	28.11.77	NA	NA	20.3.78	25	NA	NA	4	NA	PR
45.	MG Consultancy Services Ltd., Bombay	14.7.77	NA	NA	2.8.78	80	NA	NA	13	NA	PR
*46.	Shri Narayan Hari Sahasra Budha, U.K.	Jan 78	NA	NA	20.2.78	9	NA	NA	2	NA	PR
47.	Kudremukh Iron Ore Co. Ltd., Bangalore	NA	NA	5.2.78	8.3.78	517	NA	NA	NA	NA	P
48.	3D-Scanner Attachment for Weather Radar TIFR	23.1.78	NA	NA	16.3.78	6	NA	NA	3	NA	G
49.	ISRO Satellite Centre Bangalore	Sep 77	Jun 77	Jan 78	8.3.78	28	NA	NA	7	NA	G
50.	R.B.I	8.4.75	Aug 75	10.11.77	8.3.78	66	4.8.78	NA	35	NA	G
51.	Army H.Q. EDP Centre New Delhi	NA	20.5.77	NA	8.3.78	NA	NA	NA	NA	NA	G
52.	Radio Astronomy Centre, TIFR, Ooty	NA	NA	20.12.77	21.3.78	13	NA	20.11.78	NA	8	G
53.	R.R.L., Hyderabad	17.6.77	Nov 77	7.3.78	21.3.78	22	NA	NA	10	NA	P
54.	Kirloskar Oil Engines Ltd., Poona	Sep 76	Feb 77	25.8.77	21.3.78	NA	6.6.78	NA	22	NA	PR
55.	IIT, Kanpur	NA	NA	28.2.78	11.5.78	NA	NA	NA	NA	NA	P
56.	Glaxo Lab (I) Bombay	Aug 77	11.11.77	21.2.78	4.4.78	40	NA	NA	NA	8	P

1	2	3	4	5	6	7	8	9	10	11	12
57.	Indian Institute of Science, Bangalore	Dec 75	Aug 76	28.2.78	11.5.78	78	NA	NA	6	NA	P
58.	R.C.C., Calcutta	5.1.78	13.1.78	NA	1.4.78	19	NA	NA	4	NA	P
59.	Sri F.C. Chanda, USA	23.2.78	NA	NA	1.4.78	9	NA	NA	3	NA	PR
60.	DOE	NA	NA	NA	20.4.78	NA	NA	NA	NA	NA	G
61.	Indian Institute of Management, Ahmedabad	Nov 76	Jul 77	Dec 77	12.5.78	20	NA	Mar 79	19	29	P
62.	O.R.G., Baroda	3.3.77	31.10.77	NA	7.5.78	51	NA	NA	2	NA	PR
63.	MAS Services (P) Ltd., New Delhi	1.5.78	NA	NA	17.5.78	13	NA	NA	1	NA	PR
64.	Tata Consultancy Services, Bombay	17.1.78	NA	NA	16.6.78	76	NA	NA	5	NA	PR
65.	RCPO, Min of Def	26.5.78	NA	NA	10.7.78	15	NA	NA	2	NA	G
66.	NPOL, Cochin	22.4.77	Jun 77	Apr 78	15.6.78	18	NA	NA	14	NA	G
67.	NIC, New Delhi	23.3.78	NA	19.5.78	6.7.78	49	NA	NA	4	NA	G
68.	Air India, Bombay	NA	NA	NA	6.7.78	351	NA	NA	NA	NA	P
69.	IIT, Delhi	7.10.74	22.9.78	NA	28.9.78	300	8.5.88	NA	48	NA	P
70.	Deptt. of Statistics	NA	Feb 78	6.9.78	26.10.78	73	NA	NA	NA	NA	G
71.	BHEL, Tiruchi	1977	Aug 77	15.5.78	30.8.78	98	NA	NA	14	NA	P
72.	Sri Ramesh Saini & Dr. T.V. Srinivasan	12.9.78	NA	NA	17.3.78	6	NA	NA	7	NA	PR
73.	Jaslok Hospital, Bombay	24.8.78	NA	NA	3.10.78	9	NA	NA	3	NA	PR
74.	Computer Maintenance Corporation, Bombay	10.8.78	NA	NA	20.11.78	57	NA	NA	3	NA	P
75.	DOE (Systems Group)	25.10.78	NA	NA	28.2.79	25	NA	NA	4	NA	G
76.	Datamatics Consultants (P) Ltd., Bombay	15.9.78	NA	NA	15.3.79	31	NA	NA	6	NA	PR
77.	Societa International De Telecommunication Aeronautiques, Bombay	26.8.78	NA	NA	12.12.78	12	NA	NA	4	NA	PR

1	2	3	4	5	6	7	8	9	10	11	12
78.	Defence Electronics Research Lab. Hyderabad	NA	NA	28.7.78	9.2.79	25	NA	NA	NA	NA	G
79.	ADE, Bangalore	30.1.79	30.1.78	6.6.78	22.2.79	29	NA	NA	12	NA	G
80.	National Thermal Power Corporation	13.2.79	NA		3.3.79	234	NA	NA	1	NA	P
81.	Direct Data Entry Systems for BEL, RGI & Kudremukh Iron Ore Co.			30.5.78	20.12.78	5 58 5	NA NA 11.4.79	NA	NA	NA	P
82.	Oil India Ltd., Kulijan	NA	NA	7.8.78	1.1.79	48	NA	NA	NA	NA	P
83.	Intech Systems (P) Ltd.	15.7.78	NA		3.3.79	10	NA	NA	8	NA	PR

\*indicates procurement on grounds of software export or on being a Non-resident Indian.

Note 1 : Sectors under Column 12; G —Government  
P —Public  
PR—Private

Note 2 : NA stands for 'information not available'.

Note 3 : Information on Computers imported upto 1975 are not included above and are given in the following pages.

**Computers imported in India—approvals from 1970 to 1975**

S. No.	Name of organisation	Sector	Whether put up to Approval Committee	Month and year of actual import
1	2	3	4	5
1.	Aeronautics Development Establishment, Bangalore	Government	No	June 1975
2.	All India Institute of Medical Science, New Delhi	Government	No	Approved 1975 Imported 1977
3.	Army Headquarters, New Delhi	Government	No	March 1970
4.	Administrative Staff College of India, Hyderabad	Public	No	December 1975
5.	Bhabha Atomic Research Centre, Bombay	Government	No	January 1974
6.	Bhabha Atomic Research Centre, Bombay	Government	No	—
7.	Bhabha Atomic Research Centre, Bombay	Government	No	—
8.	Bharat Electronics Limited, Bangalore	Public	No	August 1975
9.	Bharat Electronics Limited, Bangalore	Public	No	—
10.	Bharat Electronics Limited, Bangalore	Public	No	—
11.	Bokaro Steel Plant, Bokaro	Public	No	1974
12.	Central Machine Tools Institute, Bangalore	Public	No	December 1974
13.	Computronics India, New Delhi	Private	No	April 1975
14.	Delhi University, Delhi	Government	No	May 1971
15.	Defence Project Cell, Delhi	Government	No	1975
16.	Electronics Corporation of India Ltd., Hyderabad	Public	No	June 1975
17.	Engineers India Ltd., New Delhi	Public	No	October 1975
18.	International Crops Research Institute for the Semi-Arid Tropics, Hyderabad	Public	No	December 1975
19.	Indian Institute of Technology, Bombay	Public	No	November 1974

1	2	3	4	5
20.	Indian Institute of Technology, Kanpur	Public	No	October 1974
21.	Indian Institute of Technology, Kharagpur	Public	No	July 1973
22.	Indian Institute of Technology, Madras	Public	No	August 1973
23.	Indian Institute of Technology, Madras	Public	No	September 1975
24.	Indian Institute of Science, Bangalore	Public	No	May 1971
25.	Indian Meteorological Deptt. Delhi	Government	No	—
26.	IPAG, Electronics Commission, New Delhi	Government	No	December 1975
27.	Indian Telephone Industries, Bangalore	Public	No	March 1975
28.	Instrumentation Ltd., Kota	Public	No	February 1974
29.	I.S.S.P., Bangalore	Public	No	February 1974
30.	Jawaharlal Nehru University, New Delhi	Government	No	December 1975
31.	Kirloskar Oil Engines Ltd. Poona	Private	No	November 1977
32.	Electronics Research & Development Establishment, Bangalore	Government	No	June 1975

### Case Histories on Computer Import

#### Case A : Private import for development of software for export

March 1977	Correspondence started in March, 1977 when Party indicated interest in importing a multi-processor system which would have potentialities for developing software for computer network. Case was not supported by background of the organisation, their past performance, justification for configuration, proforma invoice etc.
October 1977	Party revised the configuration submitted earlier.
January 1978	Party submitted proforma invoice and brief bio-data on personnel. Past performance on export still not covered.
April 1978	Party revised the mode of procurement to importing computer sub-systems on OEM basis and then integrating the same using inhouse capability. Party submitted schematic diagram on proposed system configuration. Order value was brought down to US \$ 500,000 excluding spares and test equipment.
2nd May 1978	Note was submitted to the Approvals Committee.
13th May 1978	Approval Committee's clearance conveyed to Party.
September 1979	Party had not submitted application for import licence and MRTP clearance. (Total time for giving approval---14 months)

#### Case B : Government R & D Centre

Two cases for import of computer;

- i) Computer Aided Design and Graphic Processing System;
- ii) Inhouse computer facility

##### (i) Computer Aided Design & Graphic Processing System :

July 1978	Request for clearance for the import of computer aided design and graphic processing system was referred. Party in this case had directly floated tender for procurement.
August 1978	Consideration whether Department of Electronics could accept offers received by party against their global tendering, for further processing.
1st September 1978	Decision to consider offers received by Party and nomination of evaluation committee members.
October 1978	Evaluation committee meeting held. Members agreed in principle to the shortlisting done by Party but suggested alteration in system configuration which party agreed to. Committee felt the need to have a technical presentation from the main supplier.
November 1978	Notice for technical presentation served on the bidder. Negotiating Committee Members nominated.
December 1978	Technical presentation given. Negotiation Committee meeting held. All bidders offered revised system configuration. Party desired further clarification from the bidders.
February 1979	Report received from Party. Note for approval committee taken up.

June 1979 Case cleared by Approvals Committee and approval communicated to the party.  
(Total time for giving approved---12 months)

**(ii) Inhouse computer facility :**

October 1978 Preliminary proposal for procurement of computer equipment for R & D applications received. Necessity for such a large system (worth Rs. 175 lakhs with 2M Byte of main memory) was asked for.

January 1979 Received proposals for large computers at Delhi, Calcutta, Bombay and Madras involving investment of Rs. 500 lakhs.

February 1979 Party informed that proposed system at Delhi should be used both for Party and for the Government Department's management facilities.

July 1979 Fresh proposals received from Party.

September 1979 Committee set up by Party and Government department to finalise specifications.  
(Time taken till now---12 months)

**Case C : Public Sector Undertaking**

The major computer systems imported by the undertaking were the IBM 1800 for process control applications and the Burroughs 6800 for general data processing applications. Tenders for the above mentioned computer systems were floated by undertaking.

1972 Tenders floated.

March 1973 Offers received evaluated by a Technical Committee set up with approval of the controlling Ministry and a representative of Department of Electronics was a Member of the Committee.

January 1974 The Committee submitted its report.

November 1974 Undertaking placed an order for IBM 1800 for process control system.

1976-77 Computer system delivered. The computer system utilised for more than one shift per day and data logging systems developed and implemented. (Total time taken---48 months)

The computer system for other applications was for the area of production, planning and control and related to the setting up of a mill. The technical committee set up by the undertaking recommended the purchase of ICL 1904S. The user organisation preferred an IBM computer system. In the meanwhile the quotations received in 1972 lapsed. The mill was also to come up later than earlier expected and the computer system was not immediately required.

July 1975 Undertaking submitted revised tender specifications.

October 1975 The specifications were approved by Department of Electronics and undertaking was advised to float global tenders as per the procedures applicable at that time. The tender opening date was postponed by undertaking without consulting the Department.

May 1976 The tenders were opened. The Department of Electronics asked undertaking for details of the tenders received so that they could be evaluated. They were received in October 1976.



October 1976	Tenders received and Department of Electronics set up an Evaluation Committee. The validity of all the offers had lapsed by then and undertaking was requested to get them updated. Some of the vendors submitted revised offers.
31st January 1977	Evaluation Committee met. At this meeting the members sought technical information and it was decided that Department of Electronics would make out a list of questions and request for supplementary information from the vendors. The vendors were requested to submit this information and also to quote for the newer models which they were marketing by this time.
16th April 1977	The new offers were received by the Department of Electronics and were evaluated and 5 systems were short-listed. The representatives of undertaking visited installation abroad.
15th September 1977	Views given to the Evaluation Committee after foreign visit.
October 1977	The prices of the shortlisted computer systems were negotiated
November 1977	Case put up to the Approvals Committee and final approval accorded.
Early 1978	The undertaking submitted import application, which was considered by the Department of Industrial Development.
March 1978	Import licence issued.
Mid-1978	Contract signed.
September 1979	The system is under installation and acceptance testing. (Time taken for contract-72 months)

#### **Case D: Government R&D Centre**

December 1973	The Centre had been procuring computer systems from time to time. The Centre submitted an offer by a vendor for supply of R-1050 computer system from USSR. The offer was for a price of Rs 176 lakhs in case the order was placed before 30th April 1974.
25th April 1974	The Centre wrote to the Department of Electronics requesting for permission for import.
2nd May 1974	The Department agreed in principle to the import pointing out that the technical capabilities were not fully proved, and the price appeared to be on the higher side. The Centre requested for adhoc permission for importing a small minicomputer, and this permission was accorded immediately. In the same month, the Centre requested for the import of a tape unit and this was also agreed to within 8 days of the receipt of the letter. The case for import of the R-1050 computer was held up in another Department which was the coordinating agency for import of computer system at that time. During this period, the Government of USSR and the local agents were repeatedly writing to the Department and the Centre stating that the prices would go up in case the offer was not accepted immediately. But in fact the prices were slowly declining and the price had decreased over a two year period to almost 60% of the initial price quoted in 1973.

January 1976	The request for the computer system was again made by the Centre. The Centre desired that it be permitted to import a R-1050 computer system. Department of Electronics suggested that in addition to the R-1050 computer system, there were some others which could be considered for purchase. Subsequently the Department conducted benchmark trials on the IRIS 80 (France), R-1050 (Russia), ES-1040 (West Germany) using the IBM 370/155 as a base. On the basis of this evaluation, it was felt that the ES- 1040 would not meet the computational requirements of the user.
October 1976	The Centre modified their earlier preference and they requested for permission to import the IRIS 80.
November 1976	The case was put up to the Approvals Committee.
December 1976	Permission for the import of IRIS 80 was accorded and contract signed with the suppliers. The delivery was delayed as site and airconditioning were not ready; there were problems with system acceptance tests in France. The computer system was finally installed in February 1979. (Total time taken-60 months)

**Case E: Private R&D Centre**

August 1977	The user submitted his request to the Department of Electronics.
October 1977	Approval accorded.
November 1977	User informed about the approval and requested to undertake site development work at his end. Tenders were floated by the Department and user advised to give his comments on the tenders.
February 1978	Comments received and the Department of Electronics convened meeting of the Evaluation Committee in the same month.
March 1978	Prices negotiated with the shortlisted vendors and the case put up to the Approvals Committee in the same month.
April 1978	Final approval accorded.
June 1978	User submitted import licence application, which was considered by the Department of Industrial Development. The Department of Electronics advised user to proceed with finalisation of purchase agreement in parallel.
February 1979	The computer system installed. (Total time taken - 19 months)

**Case F : Private company**

1971	Party placed order for the supply of an IBM 360/40 computer system. The Department of Electronics was not consulted. The computer system was not delivered as the party postponed action on computer procurement.
November 1977	Party applied for approval, in principle, for the import of a large-sized computer system to replace the obsolete 1401 system in use for 15 years.
May 1978	Proposal for another such system also submitted and configuration for both the systems finalised and signed by Party and Department of Electronics.

July 1978	Clearance from labour union.
February 1979	Approval given.
June 1979	Tenders opened.
August 1979	Clearance from Ministry of Labour received.
September 1979	Technical Evaluation Committee due to meet. (Time taken for approval-15 months)

**Case G : Public sector company**

November 1976	User submitted proposal to Department of Electronics (DOE) for importation of a large general purpose computer system.
April 1977	Specifications for the system approved.
December 1977	Tenders for the system were called for by Department of Electronics.
January 1978	Tenders opened. 10 suppliers/agents quoted for 14 types of computers.
April 1978	User's Technical and Financial Evaluation Reports based on the data available in tender documents and clarifications obtained from the suppliers received.
May 1978	Technical Evaluation Committee met in New Delhi to consider technical evaluation report and short list the suppliers. The Committee agreed with user's report and short-listed three out of 14 systems as recommended by user. The Committee made the following recommendations : (i) User should carry out further analysis of terminal workload including response time calculations. (ii) User should augment the manpower for its systems and programming wing as the present strength was insufficient to meet the requirements of the computer system to be procured.
July 1978	Further analysis at (i) above was carried out and the short-listed suppliers gave response time of their configuration and DOE requested to hold Negotiations Committee meeting.
September 1978	The Price Negotiation Committee meeting held in New Delhi. Discussions held with all these short-listed suppliers. Asked whether they would be willing to give further discounts on their prices, one vendor declined to do so and being the highest bidder he was eliminated. The remaining two agreed to consider further discounts on rupee component only and asked for one week's time which was agreed to.
October 1978	User made recommendations to DOE for placement of order on one vendor.
November 1978	DOE requested clarification drawing users attention to providing adequate manpower. Clarifications asked for given in the same month. The manpower requirements were also finalised and communicated to DOE.
December 1978	User had discussions at Delhi with DOE for finalising order on the vendor whose system was superior and cheaper. As per user's assessment, the total cost is Rs 115.58 lakhs and that of the other vendor is Rs 122.41 lakhs. DOE's stand is that associated elements of cost should not be taken into account in deciding about the cheaper

system. DOE suggested reconvening the Technical Evaluation Committee meeting which is to be followed by a Negotiations Committee meeting.

May 1979

Limited enquiries again floated.

June 1979

Three systems shortlisted by Technical Committee. Further action pending awaiting labour clearance.

(Time taken till now - 31 months)

#### **Case H : Public sector undertaking**

1976

The preliminary work of installing a process control computer was studied by the Party and with the support of consultants the project gathered momentum. Since then, all agencies involved were actively working on the detailed requirement of the project and it was being monitored on a continuous basis.

January 1978

Global tenders were floated and quotations opened.

May 1978

A comparative study was made by the consultants and their report forwarded to the DOE.

September 1978

Technical Evaluation Committee met in New Delhi in which it wanted a detailed report on the analysis of workload characterisation, feedback concept for process control consideration, data communication aspects, etc. Accordingly, the report was prepared by user organisation and the same was circulated amongst the Committee members.

November 1978

The next meeting of the Technical Evaluation Committee was held wherein various offers received were scrutinised from technical suitability point of view and five offers were short-listed by Committee for further negotiations.

December 1978

Discussions with the five vendors were held. One vendor withdrew his offer at the meeting. The commercial price bids were received separately from each of the short-listed vendors. Since all parties had quoted for spares, tools and test equipment at rates higher than the norms, they were requested to restrict the same to 10% of the total price quoted for the main equipment. Also some minor changes in the final configuration were suggested and the Technical Evaluation Committee members felt that the scheme, as a whole, would have to be reviewed again and a final decision for placement of order taken, in another meeting. Since it had already been impressed upon all concerned that the system should be ready by May 1979, prior to the onset of monsoon user felt that any further delay in placement of order will upset the overall schedule of the scheme. Other related areas like software development, computer building etc., were in advanced stage.

May 1979

Tender selection completed in March 1979 and case put up to Approvals Committee.

June 1979

Final approval conveyed to party.

(Time taken for approval - 18 months)

**Major equipments and systems under production in  
Central Public Sector undertakings**

**1. INDIAN TELEPHONE INDUSTRIES (ITI)****1. Value of Production**

(Rs. in lakhs)

Division	1975-76	1976-77	1977-78	1978-79
<b>Bangalore</b>				
Strowger Division	1,947	2,193	2,358	2,181
Telephone Division (instruments)	1,000	1,066	1,105	1,111
Crossbar Division	1,767	1,883	1,792	1,793
Transmission Division (Power line circuit etc.)	1,573	2,117	1,876	1,871
	<u>6,287</u>	<u>7,258</u>	<u>7,131</u>	<u>6,956</u>
<b>Naini</b>				
Transmission Equipment Division	894	923	1,021	1,199
Telephone Instruments Division	197	331	381	419
	<u>1,091</u>	<u>1,254</u>	<u>1,402</u>	<u>1,618</u>
<b>Rae Bareli</b>				
Switching Division (Strowger Equipment)	15	125	316	396
<b>Palghat</b>				
Electronic Switching Division (Small electronics exchanges)	Nil	10	6	10
<b>Srinagar</b>				
Components Division (components for ITI consumption)	32	23	41	37
Total Sales	7,425	8,671	8,896	9,017
Services	112	138	320	276
Turnover	<u>7,537</u>	<u>8,809</u>	<u>9,216</u>	<u>9,293</u>

**2. Product Mix**

**Strowger Exchange Equipment** (equivalent exchange lines; spares in equivalent lines supplied in addition are shown in brackets)

(i) Bangalore	1,42,168 (17,928)	1,46,436 (16,837)	1,32,822 (25,749)	1,33,001 (28,062)
(ii) Rae Bareli	1,125	10,575	16,000	21,375

	1975-76	1976-77	1977-78	1978-79
<b>Telephone Instruments (Nos.) (value of spares supplied in addition to P &amp; T in brackets)</b>				
(i) Bangalore	3,00,669 (Rs 213 lakhs)	3,03,512 (Rs 213 lakhs)	3,03,612 (Rs 240 lakhs)	3,00,660 (Rs 300 lakhs)
(ii) Naini	1,00,010	1,33,000	1,17,525*	1,11,635
*excluding components supplied for assembly of 5100 telephones at Srinagar Unit				
(iii) Srinagar	—	—	5,100 Nos.	12,634 Nos.
<b>Transmission Equipments (Rs lakhs)</b>				
(i) Bangalore	1,573	2,117	1,876	1,871
(ii) Naini	894	923	1,021	1,199
<b>Crossbar Switching Equipment (equivalent exchange lines)</b>				
Bangalore (Jorbagh pattern)	1,06,880	1,10,310	1,00,010	1,01,240
<b>Electronic Switching Equipment</b>	—	300 lines	896 lines	992 lines
<b>3. Percentage of Sales gone to the P &amp; T</b>				
1975-76	84%			
1976-77	81%			
1977-78	79%			
1978-79	82%			
<b>4. Total number of employees of the Company (1.1.1979)</b>				
(i) Bangalore	19,336			
(ii) Naini	4,087			
(iii) Srinagar	106			
(iv) Palghat	107			
(v) Rae Bareli	2,225			
Total	25,861			
<b>5. Gross Assets and Net Fixed Assets on 31.3.1979 (Rs. in crores)</b>				
Gross Assets	50.68			
Net Fixed Assets	33.07			

## 2. BHARAT ELECTRONICS LIMITED (BEL)

### 1. Production

(Rs in lakhs)

Year	Bangalore Complex			Ghaziabad	Total
	Equipment	Components	Total		
1975-76	3372	2094	5466	752	6218
1976-77	4082	1817	5899	702	6601
1977-78	4578	2166	6744	756	7500
1978-79	4308	2515	6823	464	7287

## 2. User-Wise Production and Sales:

Year		Total	Defence	%	Non-Defence	%
1975-76	(Production)	6218	2539	41%	3679	59%
1976-77	„	6601	2557	39%	4044	61%
1977-78	„	7500	3115	42%	4385	58%
1978-79	„	7287	2090	29%	5197	71%
1975-76	(Sales)	5567	3048	55%	2519	45%
1976-77	„	6537	2676	41%	3861	59%
1977-78	„	7460	2730	37%	4730	63%
1978-79	„	7554	2552	35%	5002	65%

## 3. Production planned for 1979-80

### Bangalore Complex

Equipments—	Rs 46 crores	
Components—	Rs 30 crores	Rs 76 crores
Ghaziabad Unit		Rs 14 crores
Total		Rs 90 crores

## 4. Number of Employees (as on 30.11.1978)

	Executive	Non-executives	Total
Corporate Office (including Regional Offices)	52	131	183
Bangalore Complex	1377	12470	13847
Ghaziabad Unit	339	2132	2471
Pune Unit (under construction)	2	59	61
Total	1770	14792	16562

## 5. Assets

(as on 30.11.1978)

Gross Block	Rs 56.28 crores
Net Block	Rs 24.82 crores
Net Worth	Rs 36.22 crores

## 6. Major product lines :

### Bangalore

- Defence Communication Equipment (transreceivers, transmitters, receivers, D.F. equipment, mobile transmitting stations)
- Radars (Fire control, Navigation, Meteorological, Surveillance)
- Navigational Aids
- Gun Control equipment
- Computer Systems and Peripherals
- Radio and TV Broadcast and Studio equipment
- Telemetry & Communication System for users like IOC, State Police, etc.
- Components-electron tubes, Semiconductor Devices and ICs, Passive Components (Total components' annual production about Rs 20 crores)

**Ghaziabad :** Equipment requirements of the ADGES Plan-Radars, Tropo and LOS microwave systems, data processing and data handling systems.

**Pune :** Components for night vision, like Image converters and Image intensifiers

### 7. Customer Profile

Defence	---	40%
Civil Government	—	24%
Private Sector	—	25%
Export	—	11%

### 3. ELECTRONICS CORPORATION OF INDIA LIMITED (ECIL)

Actual Production during the last 4 years:

1975-76	:	Rs 2900.57 lakhs
1976-77	:	Rs 3238.23 lakhs
1977-78	:	Rs 3373.08 lakhs
1978-79	:	Rs 3454.02 lakhs

(further details in Appendix 12.1)

### 4. HINDUSTAN TELEPRINTERS LIMITED (HTL)

1. Actual production during the last three years:

Production	1975-76	1976-77	1977-78
Value (in Rs. lakhs)	505	548	545
Teleprinters (Units)	5857	6632	6142
Electric Typewriters (Nos)	168	205	273

2. Distribution of sales turnover during last three years according to major users, indicating inter alia, the percentage of sales which have gone to the users:

Customer	1975-76	1976-77	1977-78	1978-79
<b>P&amp;T</b>				
Units	3960	4703	4955	4538
Percentage	71.75%	70.70%	79.22%	78.80%
<b>Defence</b>				
Units	975	299	714	592
Percentage	17.67%	4.50%	11.42%	10.30%
<b>Newspapers</b>				
Units	50	59	74	165
Percentage	0.91%	0.89%	1.18%	2.80%
<b>Railways</b>				
Units	68	80	54	46
Percentage	1.23%	1.20%	0.86%	0.80%
<b>Others</b>				
Units	466	1511	458	416
Percentage	8.44%	22.71%	7.32%	7.3%
<b>Total Units</b>	<b>5519</b>	<b>6652</b>	<b>6255</b>	<b>5757</b>

3. The Company has only one factory at Madras. The product lines of the factory at present are :

- (i) Telecommunication Equipment—Teleprinters & Accessories & Testing Equipment
- (ii) Office Equipment —Electric Typewriters
- (iii) Computer Peripherals —Data Modems, High Speed Tape Readers & Punches  
(Production just commencing)



4. Capacity and Production in 1977-78 (figures in brackets indicate corresponding figures for previous year).

Sl. No.	Goods produced	Capacity		Production
		Licensed	Installed	
(i)	Teleprinters Accessories			
	(a) Teleprinters (Units)	8500 (8500)	5400 (8500) in double shift)	6142 (6632)
	(b) Terminal Units	—	—	10 (10)
	(c) Consoles for RCPO	—	—	1 (53)
	(d) Rectifiers for RCPO	—	—	Nil (10)
	(e) TT5B Tables	—	—	33 (195)
	(f) TDMS	—	—	10 (6)
	(g) TDSG	—	—	20 (6)
(ii)	Electric Typewriters (Nos.)	4000 (4000)	1000 (1000)	273 (205)
(iii)	Regenerative Testers	—	—	Nil (Nil)
(iv)	Stamp Cancelling Machines	—	—	Nil (7)
(v)	Data Modern	—	—	15 (18)
5.	Value of production planned for 1978-79	—		Rs 622.66 lakhs
6.	Actual production in 1978-79	—		Rs 526.83 lakhs
7.	Total number of employees of the Company as on 1-1-1979	—		1974
8.	(a) Gross Assets			Rs 465.82 lakhs
	(b) Net fixed assets of the company as on 1-1-1979			Rs 240.35 laks

5. INSTRUMENTATION LIMITED, KOTA (IL)

1. Major Product Lines :

Electronic instruments, Electronic Exchanges, Pneumatic Instruments, Gas Analysers, Panel, Annunciators etc., Temperature Instruments etc.

2. Actual production during the last 4 years is as under :

(Rs. in lakhs)

	1975-76	1976-77	1977-1978	1978-79
i) Total	574.27	753.82	930.81	1063.00
ii) Electronic items	262.10	333.29	393.05	473.40
iii) Major production items (excluding electronic items)	312.17	420.53	537.76	590.60

3. Production of different units of the Company during last 4 years is as under :

(Rs. in lakhs)

	1975-76	1976-77	1977-78	1978-79
Kota Unit	521.40	591.14	705.76	710.3
Palghat Unit	52.87*	162.68	225.05	352.7

\*(Four months' production only)

4. Break-up of turnover (including production and bought out items) during last 4 years according to major users is as under :

	(Rs. in lakhs)			
	1975-76	1976-77	1977-78	1978-79
Central Government Departments, and Public Undertakings	489.30	517.76	631.03	910.54
State Government	372.47	765.23	1187.99	1733.77
Export	118.58	91.61	17.30	95.02
Private Sector	79.38	146.31	113.45	81.05
<b>Total</b>	<b>1059.73</b>	<b>1520.91</b>	<b>1949.77</b>	<b>2820.38</b>

- |  |           |                   |
|--|-----------|-------------------|
| 5. Production targets for 1979-80 (Rs. in lakhs)     | Kota-1200 | Palghat-450       |
| 6. Total number of regular employees as on 31.3.1979 | 2679      |                   |
| 7. Gross fixed assets as on 31.3.1979                | —         | Rs. 1170.36 lakhs |
| 8. Depreciation upto 31.3.1979                       | —         | Rs. 479.66 lakhs  |
| 9. Net fixed assets                                  | —         | Rs. 690.70 lakhs  |

#### 6. HINDUSTAN AERONAUTICS LTD., HYDERABAD, (HAL/HD)

	(Rs. in lakhs)		
	1975-76	1976-77	1977-78
1. Production			
Defence	955.77	1018.44	1134.39
Non-Defence	86.93	10.26	13.87
<b>Total</b>	<b>1042.70</b>	<b>1028.70</b>	<b>1148.26</b>
2. Total fixed assets	1064.57	1124.75	1241.58
3. Expenditure on R & D			
Capital	27.43	26.95	22.94
Revenue	14.06	23.30	49.28
<b>Total</b>	<b>41.49</b>	<b>50.25</b>	<b>72.22</b>

- |   |      |      |      |
|---|------|------|------|
| 4. Number of employees  | 2916 | 3082 | 3188 |
| 5. Product Mix: Avionics equipment such as, vhf/uhf communication sets, air borne radars, radio compass, radio altimeter, IFF, sonobuoy, surveillance and precision approach radar. |      |      |      |

#### 7. CENTRAL ELECTRONICS LIMITED (CEL)

- Central Electronics Limited, a Government of India Enterprise was incorporated as a Limited Company under the Companies Act, on 24th June 1974 with an authorised capital of Rs. 5 crores.
- The Company is located at site No. 4, Industrial Area, Shaibabad (U.P.) in Ghaziabad District.
- The main objective for which the Company was established was to manufacture electronic components, materials and systems with indigenous technology, developed in CSIR and other National Laboratories.

4. The Company's Revised Project Estimates were approved by the Cabinet in June, 1977 according to which the total investment by the year 1984-85 will be Rs. 700 lakhs with total saleable production of Rs. 1018 lakhs and a manpower plan of 2000 (approximate).
5. The products included in the Company's production plan are as under :

Name of the Product	Production volume envisaged by 1984-85 (Rs lakhs)
Professional Ferrites	200.00
Electronic Ceramics	200.00
Special Electron Tubes	76.00
Liquid Crystal Display	170.00
Power Electronic Equipment	:
Microwave Oven	:
Analytical and Laser System	:
Workshop & Tool Room	72.00
<b>Total</b>	<b>1018.00</b>

6. The Company has established a production capacity of 60 tonnes in its Professional Ferrites Division as planned.
7. As regards Electronic Ceramics and Instruments and Systems Divisions are concerned pilot production has been established. The imported equipment for ceramic capacitors is undergoing trial runs. PZT elements of ceramics group have been successfully developed and manual production is going on.
8. Agreements for Engineering Consultancy with CEERI, Pilani, (a premier CSIR Laboratory) have been entered into for transfer of know-how in respect of (a) Microwave Tubes of 0.5 and 1 MW capacity and (b) Power Electronic Equipment (Thyristors for Railways), The production at the factory has yet to start

(Rs. in lakhs)

9. Financial position :	1975-76	1976-77	1977-78	1978-79
a) Paid up capital	135.00	220.00	315.00	350.00
b) Borrowings from GOI	25.00	57.00	113.74	170.00
c) Gross block	66.00	199.19	226.66	336.00
d) Net fixed assets	56.55	168.60	211.64	249.00
e) Production	4.48	8.57	35.35	93.50
f) Sales	3.37	5.89	17.82	43.22
g) Net loss	12.75	35.21	40.48	28.16

## 8. BHARAT DYNAMICS LIMITED (BDL)

Bharat Dynamics Limited was established in Hyderabad in August, 1970, primarily as production agency for guided missiles. The first programme of production was licence production of anti-tank guided missile system. The production of this involved setting up production of missile and firing maintenance equipment which covered electronics. The Company has also undertaken production of electronic assemblies for Torpedos and Sonar based on indigenous development. Recently, production of four prototypes of mini-computers developed indigenously were taken up. All these equipments are ruggedised in design

to withstand stringent Defence environmental requirements. The financial performance of the undertaking is given below :

	(Rs lakhs)		
	1977-78	1976-77	1975-76
Sales turnover	630	533	405
Production	544	553	320
Profit before tax	134	67	10
Gross block	357	313	212

## 9. ELECTRONICS TRADE AND TECHNOLOGY DEVELOPMENT CORPORATION (ETTDC)

The ETTDC was set up in 1974 to streamline and execute electronics import and export trade and to promote aspects related to technology development. The turnover of the Corporation during 1976-77 was Rs 649.12 lakhs inclusive of Rs 50.99 lakhs of exports. During 1977-78, the Company increased its turnover to Rs 1154.50 lakhs inclusive of Rs 128.19 lakhs of exports. The Company earned a profit of Rs 25.69 lakhs before tax, during 1976-77 and Rs 51.90 lakhs during 1977-78. The exports during 1977-78 consisted of items like electronic components, voltage stabilisers, oscilloscopes, printed circuit boards, telephone cable, computer software etc. The break-up of the sales turnover is as follows :

	(Rs in lakhs)		
	(Year ending July)		
	Actuals for 1977-78	Actuals for 1978-79	Budget for 1979-80
1. Components & Materials			
(a) Imports	775.27	929.00	955.00
(b) Exports	18.37	52.00	50.00
	793.64	981.00	1005.00
2. Equipment & Systems			
(a) Imports & Import substitution sales	251.03	198.00	325.00
(b) Exports	109.83	35.00	170.00
Grand Total	1154.50	1214.00	1500.00

### 3. The Financial Performance of the Company for 1978-79 was as below :

	(Rs in lakhs)
Net profit after tax provision	19.77
Total interest paid on long-term borrowings	2.20
Total corporate tax provision	24.16
Total gross profit (1+2+3)	46.13
Total capital employed (fixed assets less depreciation plus working capital)	235.98
Gross profit percentage to capital employed	19.54%
Depreciation	1.75
Gross margin (gross profit plus depreciation)	47.88
Gross margin as percentage to capital employed	20.28%

## 10. COMPUTER MAINTENANCE CORPORATION (CMC)

1. During 1977-78, the company incurred a loss of Rs 49.01 lakhs and the accumulated loss as on 31.3.1978 was Rs 54.32 lakhs. The turnover for the year 1978-79 was Rs 547 lakhs, the break-up being as follows :

(Rs in lakhs)		
Activity	1978-79	1979-80 (Estimated)
Maintenance & Field Engineering		
IBM	526	600
Imported	15	25
Indigenous	—	—
	<u>541</u>	<u>625</u>
(i) Software & Systems Consultancy	1	
(ii) Training	1	
Sales		
Mixed System		
Data Preparation Equipment		
Spares	4	
	<u>6</u>	
	<u>547</u>	<u>625</u>

2. Financial Performance Figures of the Company for the year 1978-79 is as below :

(Rs in lakhs)	
Net profit	78.27
Interest	30.38
Total Corporate tax paid	No tax liability in view of accumulated losses and deductions available under Section 35 of the Income-tax Act.
Total gross profit (1+2+3)	108.65
Total capital employed (fixed assets less depreciation plus working capital)	606.99
Gross profit as percentage of capital employed	18%
Depreciation	24.79
Gross margin (gross profit plus depreciation)	133.45
Gross margin as percentage of capital employed	22%

## 11. SEMICONDUCTOR COMPLEX LIMITED (SCL)

The Semiconductor Complex Limited was registered in January, 1978 with the object of manufacturing Large Scale Integrated Circuits and allied products. The company is expected to start production in 1980-81.

### **Government Resolution setting up Electronics Commission**

The Government of India attaches the highest importance to the development of an integrated and self-reliant electronics industry in the country, as rapidly as possible. Electronics occupies a key position in modern science and technology. It has a vital role to play in the fields of Atomic Energy, Communications, Defence, Education, Entertainment and Space Technology. It is assuming increasing importance in the monitoring and control of production processes in the Engineering, Chemical and Metallurgical industries. Because of its dynamic character, its pervasive nature and its significant impact on science, industry and society, electronics is today in the vanguard of technological progress. Technological progress and obsolescence are both very rapid in this field. An intensive promotional effort relating to both production and research and development is therefore essential to ensure a rapid growth of self-confidence and of indigenous capabilities.

In order to ensure the necessary balanced development of electronics in the country, the Government of India consider it necessary to set up an organisation free from all non-essential restrictions or needlessly inelastic rules, which will review the entire field of electronics with regard to research, development and industrial operations, with full authority to formulate policy in this field and to direct implementation, on sound technical and economic principles, of all measures, both promotional and regulatory, that are necessary for the country to attain self-reliance in the shortest possible time and in the best possible manner.

2. After careful consideration the Government of India have decided to establish an Electronics Commission with full executive and financial powers.

#### **3. Constitution :**

- (a) The Electronics Commission shall consist of full time and part time members. The total number of members shall not be less than four but not more than seven.
- (b) The Chairman of the Electronics Commission will also be Secretary to the Government of India in the Department of Electronics.
- (c) A member of the Commission will be the Member for Finance who shall also be ex-officio Secretary to the Government of India in the Department of Electronics in financial matters.

#### **4. Functions :**

The Electronics Commission shall be responsible :

- (a) for formulating policy in the field of electronics, paying due regard to other general policies of Government ;
- (b) for preparing the budget of the Department of Electronics for each financial year and obtaining Government approval thereto ; and
- (c) for the implementation of Government policy in all matters concerning electronics through appropriate agencies of Government.

5. Within the limits of the budget provision, approved by Parliament, the Commission shall have the powers of the Government of India, both administrative and financial, for carrying out its work.

**6. Chairman :**

- (a) The Chairman, in his capacity as the Secretary to the Government of India in the Department of Electronics shall be responsible for arriving at decision on technical questions and advising Government on matters of policy relating to electronics. All recommendations of the Commission on policy and allied matters shall be put up to the Prime Minister through the Chairman.
- (b) The Chairman shall have the power to overrule the other Members of the Commission, except that the Member for Finance shall have the right to ask that any financial matter, in which he does not agree with the Chairman, be referred to the Prime Minister and the Finance Minister.
- (c) The Chairman may authorise any Member of the Commission to exercise on his behalf, subject to such general or special orders as he may issue from time to time, such of his powers and responsibilities as he may decide.

**7. Member for Finance :**

The Member for Finance shall exercise the powers of the Government of India in financial matters concerning the Department of Electronics except in so far as such powers have been, or may in future be, conferred on or delegated to the Department.

8. The Commission shall have power to frame its own rules of procedures. It may meet at such times and places in India as may be fixed by the Chairman.

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(Above is a copy of Cabinet Secretariat, Department of Cabinet Affairs, Resolution No. 26/7/70-EC dated 1st February, 1971 as amended vide Resolution No. 26/1/76/EC dated 9.7.1976. Other decisions of the Government in regard to the setting up of the Electronics Commission are given in the following pages, being extracts from the Note which formed the basis of the Resolution).

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**Broad list of responsibilities of the Electronics Commission (as approved by the Government)**

- (a) Call upon the important users to present their short and long term requirements of equipment, with their specifications, with a view to determining the appropriate systems and technologies involved.
- (b) Make a comprehensive assessment, in both technical and financial terms, of national needs for all electronics products, and integrate such needs into a single overall framework.
- (c) Direct the promotional and regulatory measures required to ensure quality production of electronics equipments at satisfactory prices.
- (d) Design and implement policies and procedures for the provision of manufacturing technology for the electronics industry, through a mix of domestic design and imported knowhow which will ensure that the industry develops on the basis of maximum self-reliance.
- (e) Survey, plan, initiate, financially support and monitor, an integrated national research and development programme, involving Government laboratories, public and private sector companies, and academic institutions that exist, as also, those which may come into being in the future, aimed at generating all the knowhow necessary for production programmes.
- (f) Take the lead in interfacing research and development with production, by amongst other measures,

- (i) promoting the acquisition of technical capacity, and providing the finances, for the design and engineering of pilot plants and prototype production facilities based on locally developed processes and designs.
- (ii) taking special steps, such as provision of subsidies, to ensure that the high cost of limited volume production, which our needs often call for, is not allowed to become an obstacle to starting commercial manufacture of products, based on local knowhow.
- (iii) providing risk capital and industrial support, for commercially exploiting electronics products devised by individual inventors.
- (g) (i) Survey, plan and approve programmes in the public, private and small scale sectors, for the production of those materials, components, equipment and systems, the need for which has been identified by (b) above, and the know-how for which has been generated through (d), (e), and (f), or otherwise.
- (ii) Take steps to assist in the fabrication of as much of the plant and machinery needed for approved production programmes, as the Commission deems possible.
- (iii) Be responsible for operating all necessary industrial and import licensing policies and procedures, as far as the electronics industry is concerned.
- (h) Make a determined effort to design and enforce the use of engineering and materials standards suited to our conditions, even in cases where production is based on imported knowhow.
- (i) (i) Assess the qualitative and quantitative needs for manpower in the various sectors of the industry, such as research and development, production, marketing, maintenance etc and take necessary steps to make such manpower available in time.
- (ii) Make every effort to generate as many employment opportunities as possible for any given investment, whether in manufacturing or in other sectors of the industry, such as marketing and maintenance.
- (j) Take action to expand the fields of application of electronics in the national economy.
- (k) Advise Government on matters governing the issues by the Controller of Patents and Designs of patents affecting the Industry in India.
- (l) Take all other steps which it deems necessary to promote a self-reliant Electronics Industry. The Commission shall, in pursuance of its responsibilities indicated in the above section, be free to set up laboratories, companies or other facilities and operate them directly under its own management, if it deems that existing facilities administratively located in other Ministries/Departments are inadequate, that no facilities of the desired kind are in existence in the country, or for any other reason.

**Scope of work and powers of the Electronics Commission and of the Department of Electronics (as approved by the Government)**

- (i) Within the framework of accepted national policies the Department of Electronics will be the authority of the Government to exercise regulatory control and supervisory functions with regard to the import of items, industrial licensing, foreign collaboration and capital goods import.

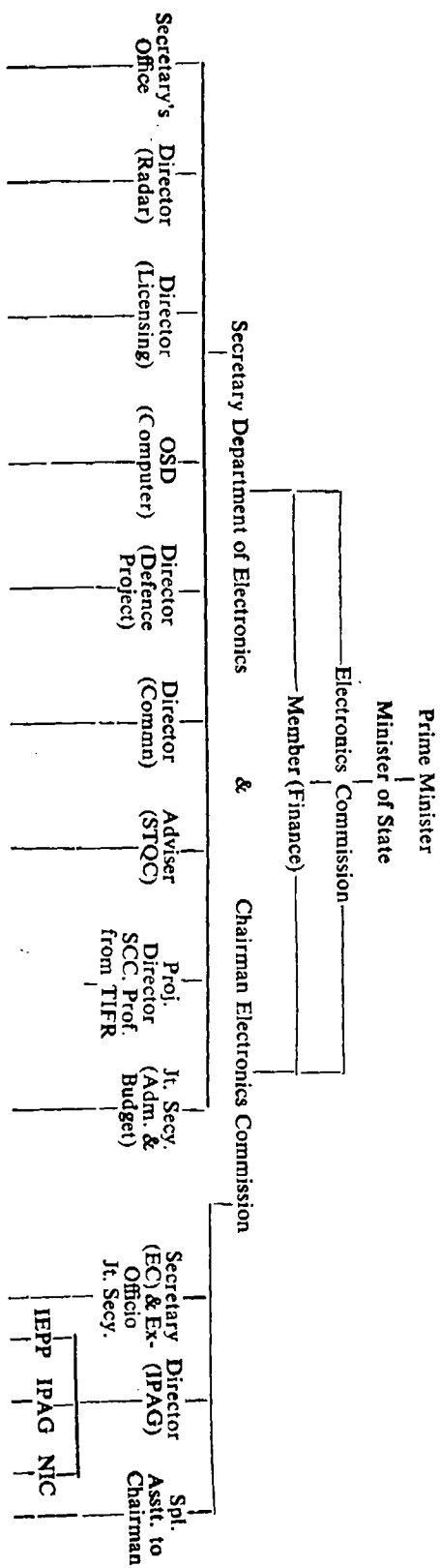


- (ii) Proposals for the imports of high value items relating to electronics by all Ministries, Departments and Institutions in the country will have to be subject to a procedure of scrutiny or post-facto review by the Electronic Commission.
- (iii) All Ministries/Departments will make available to the Commission, as and when required in the course of its work, the technical features and performance characteristics of the electronics equipment in their use or on order at any time.
- (iv) The Commission has the authority to call for and examine the annual financial allocations for electronics items of the various Ministries/Departments of the Government with regard to their R & D as well as industrial activities.
- (v) While it would be open to each Department/Undertaking or Institution to proceed, as upto now, with R & D work of limited application, it would be essential to dovetail major proposals such as those relating to complete systems or assemblies, into the national effort being organised by the Commission. As such, all schemes whether current already or not, which relate to the development of complete systems, or assemblies, shall henceforth bear the general scrutiny of the Commission.
- (vi) The Commission might approve and launch schemes of special significance, after rough scrutiny of their scope, work schedule, estimates, funding procedures, composition of R & D groups etc. Such schemes approved by the Commission will ordinarily be sanctioned by the Government without subjecting them to a re-check of the contents within the ambit of the relevant Ministries/Departments or Institutions concerned in the normal course. Depending upon the advice of the Commission such schemes may also qualify for special consideration in the matter of purchase and import procedures, financing, building works etc. In appropriate cases, where the scheme is entrusted to an official agency, the expenditure may, in the first instance, be debited to the Department of Electronics and adjusted as deemed proper later.
- (vii) The Department of Electronics, after obtaining instructions from the Electronics Commission, will cooperate with the Ministry of External Affairs in formulating Government policies regarding aspects of electronics having international implications. The implementation of the policies so drawn up would be in the hands of the various Departments/users in India in accordance with the allocation of Government business.
- (viii) The Economic Adviser to the Government of India in the Ministry of Industrial Development & Internal Trade shall, acting on detailed instructions to be issued by the Commission, evolve measures to secure periodical reports of the nature and quantum of imports of electronic items actually taking place and transmit them regularly to the Commission through the Department of Electronics.
- (ix) Officers concerned with the consideration of applications and grant of import licences in the D.G.T.D. and CCI & E will also supply to the Commission regularly, statistics of the licences for electronic items actually issued.

- (x) The Department of Electronics has been exempted from the U.P.S.C., D.G.S. & D., C.P.W.D. and C.C.P. & S. procedures and regulations for the relevant aspects. Further, in the area of personnel policies the present practice adopted by the Department of Atomic Energy with regard to the grant of extra increments and rationalisation of the dates of increments merit promotions, foreign delegations and physical fitness for employment, will also apply to the Department of Electronics. In all other matters, except to the extent indicated in special rules and procedures that may be laid down by the Electronics Commission, the normal rules and orders of Government will apply.
- (xi) Applications under the Industries (Development & Regulation) Act, shall be disposed of by the Ministry of Industrial Development and Internal Trade under the normal procedures relevant thereto; a special sub-committee of the Licensing Committee will be established, if necessary.



# ORGANISATIONAL CHART



	-	-	1	1	2	1	-	-	-	-	2	5	5	-	
	-	-	-	1	1	-	-	2	2	US & Equivalent	-	1	-	-	
	-	10	3	3	6	3	-	1	1	SSO, IFA & Equivalent	1	4	21	-	
	-	1	4	2	10	1	-	-	-	JSO & Equivalent	2	3	18	-	
Sub-Total	-	11	8	7	19	5	-	3=55	10=22	SO & Equivalent	4	6	25	-=36	
Total	-	11	12	7	24	6	1	1	13=77	Equivalent	9	19	69	-=9	
	1	2	1	3	18	1	1	1	19	Asstt. & Equivalent	4	6	22	34	1
	-	-	-	-	-	-	-	-	2	Jr. AO & Equivalent	-	-	-	-	-
	1	2	8	3	10	1	1	1	23	UDC & Equivalent	1	1	10	8	-
	1	2	6	4	22	1	1	1	29	LDC & Equivalent	2	1	15	49	-
	1	2	2	1	26	1	1	1	22	Gr. D	2	2	14	1	-
Grand Total	4	19	29	18	100	10	5	3	108=298		10	19	70	161	1=2

- Note : 1. Director (IPAG) has been declared as head of department and also delegated most of the powers of the Secretary under Delegation of financial powers etc. rules.
2. Only posts with persons in position have been indicated.
3. Chart gives position around February 1979.